



PROCEEDING OF THE
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
(Established by Govt. Act No. 30 of 2008)
Kukatpally, Hyderabad – 500 085, Telangana (India)
PRESENT Dr. N. YADIAH REGISTRAR

Procs No. JNTUH/TEQIP-III/CRS/2019/EEE/05

Date: 22/07/2019

Subject: Award of the project titled “Introducing Pulsatile flow through BLDC motor control for Ventricular Assist Devices” under Collaborative Research Scheme, TEQIP-III, JNTUH.

Read: Note order of the Vice-Chancellor dated 22.07.2019

ORDERS:

The project titled “Introducing Pulsatile flow through BLDC motor control for Ventricular Assist Devices” is awarded with sanctioned amount of Rs 2,50,000/- (Rupees two lakhs and fifty thousand only) under Collaborative Research Scheme, TEQIP-III, JNTUH to the following investigators.

1. Principal Investigator : **Dr. Anil Kumar Puppala**
Department Name : Electrical and Electronics Engineering
Institute Name : Geethanjali College of Engineering & Technology.
2. Co-Principal Investigator-1 : **Dr. Venkateshwarlu S.**
Department Name : Electrical and Electronics Engineering
Institute Name : CVR College of Engineering.

With the following terms and conditions to the Investigators:

1. The institute where Principal Investigator is working becomes the lead Institute.
2. An Initial grant of Rs.1,00,000/- will be released to the account of the principal of lead institute.
3. In case if both PI and Co-PI-1 are from affiliating institutions, a joint account should be operated by PI, Co-PI-1 and Principal of lead institute.
4. If Co-PI-1 is from the Constituent colleges of JNTUH (JNTUHCEH, JNTUHCEJ, JNTUHCEM, JNTUHCES), PI and Co-PI will operate a Joint account and fund will be transferred for lead institute Principal account.
5. In case, PI or Co-PI leave the institute for any reason or withdraw from the project (proper justification should be communicated to the University), he/she shall be treated as withdrawn from the project.
6. PI's and Co-PI's should fill the Forms A to F and submit to TEQIP-III JNTUH whenever required.
7. PI's and Co-PI's should submit Form A within 3 days after receiving the sanction letter.
8. PI's and Co-PI's should be present at the time of first Progress evaluation after 4 months and all other subsequent Progress Evaluations (once in 4 months) conducted at TEQIP-III JNTUH.
9. The Second Installment of Rs.1,00,000 of Research grant will be released on satisfactory performance in first Progress Evaluation and submission of Form B and Form D duly filled and signed.
10. The 3rd and final installment will be released upon submission of Form C and D and satisfactory Performance in the next Progress Evaluation.

Phone: Off: +91-40-23158665
Fax: +91-40-23158665
Web : www.jntuh.ac.in
E Mail: jntuhteqip@jntuh.ac.in



OFFICE OF THE TEQIP - III
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
(Established by Govt. Act No.30 of 2008)
Kukatpally, Hyderabad – 500 085, Telangana (India)

PROJECT COMPLETION CERTIFICATE

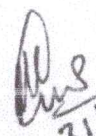
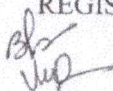
SUB: - Project completion certificate – refund of unspent balance upon submission of Utilization Certificate.

Sir/Madam,

It is acknowledged that the project sanctioned to

1. **Dr. Anil Kumar Puppala**, Geethanjali College of Engineering & Technology
2. **Dr. Venkateshwarlu S**, CVR College of Engineering

With Procs No.JNTUH/TEQIP-III/CRS/2019/EEE/05 dated on **22-07-2019** under collaborative Research scheme; TEQIP-III JNTUH is completed 30-03-2021. Out of the sanctioned amount of Rs **2,49,493/-**, utilized (including Interest) amount is Rs **2,49,493/-** and unspent amount for Rs **NIL** is refunded. In this connection Utilization certificate is submitted by Investigators in compliance to the above.


31/3/21
REGISTRAR



PRINCIPAL
Geethanjali College of Engg. and Tech.
Chilakalurthi (V), Kasara (M), Madhwal, Dist(S),-501301



PROCEEDING OF THE
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(Established by Govt. Act No. 30 of 2008)

Kukatpally, Hyderabad – 500 085, Telangana (India)

PRESENT Dr. N. YADAVIAH REGISTRAR

Procs No. JNTUH/TEQIP-III/CRS/2019/EEE/07

Date: 22/07/2019

Subject: Award of the project titled “**Deep learning based Smart Assistant for blind People**” under Collaborative Research Scheme, TEQIP-III, JNTUH.

Read: Note order of the Vice-Chancellor dated 22.07.2019


ORDERS:

The project titled “**Deep learning based Smart Assistant for blind People**” is awarded with sanctioned amount of **Rs.2,70,000/-** (Rupees two lakhs and seventy thousand only) under Collaborative Research Scheme, TEQIP-III, JNTUH to the following investigators.

1. Principal Investigator : **Dr. Rashmi Kapoor**
Department Name : Electrical and Electronics Engineering
Institute Name : VNR Vignana Jyothi Institute of Engineering & Technology.
2. Co-Principal Investigator-1 : **Dr. M. Sushama**
Department Name : Electrical and Electronics Engineering
Institute Name : JNTUH College of Engineering Hyderabad.
3. Co-Principal Investigator-2 : **Dr. M. Aruna Bharathi**
Department Name : Electrical and Electronics Engineering
Institute Name : Geethanjali College of Engineering & Technology.

With the following terms and conditions to the Investigators:

1. The institute where Principal Investigator is working becomes the lead Institute.
2. An Initial grant of Rs.1,00,000/- will be released to the account of the principal of lead institute.
3. In case if both PI and Co-PI-1 are from affiliating institutions, a joint account should be operated by PI, Co-PI-1 and Principal of lead institute.
4. If Co-PI-1 is from the Constituent colleges of JNTUH (JNTUHCEH, JNTUHCEJ, JNTUHCEM, JNTUHCES), PI and Co-PI will operate a Joint account and fund will be transferred for lead institute Principal account.
5. In case, PI or Co-PI leave the institute for any reason or withdraw from the project (proper justification should be communicated to the University), he/she shall be treated as withdrawn from the project.
6. PI's and Co-PI's should fill the Forms A to F and submit to TEQIP-III JNTUH whenever required.
7. PI's and Co-PI's should submit Form A within 3 days after receiving the sanction letter.
8. PI's and Co-PI's should be present at the time of first Progress evaluation after 4 months and all other subsequent Progress Evaluations (once in 4 months) conducted at TEQIP-III JNTUH.
9. The Second Installment of Rs.1,00,000 of Research grant will be released on satisfactory performance in first Progress Evaluation and submission of Form B and Form D duly filled and signed.
10. The 3rd and final installment will be released upon submission of Form C and D and satisfactory Performance in the next Progress Evaluation.


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11. The project should results in at least one publication in the relevant Journal national/international (Non Payment Journal).
12. PI's and Co-PI's will be informed if there are any directions from NPIU or changes made by TEQIP-III JNTUH relevant to Collaborative Research Scheme time to time and are to be followed in due course till the completion of TEQIP-III Project
13. All non-consumables procured for the research project will automatically become the property of the lead institution after completion of the project.
14. Any deviation in the expenditure as defined in the project proposal is not accepted. In such case prior permission is necessary from the university. After obtaining necessary permission, funds should be utilized as per the revised guidelines. No deviation is accepted.
15. Any interest incurred should be deposited back to the university JNTUH, TEQIP-III Account.
16. Unspent amount as per the proposal/ Guidelines of the TEQIP within the stipulated time should be deposited back to the university TEQIP account. (Along with Interest Incurred).
17. Any discrepancy with Co Investigator and principals while implementing the project to be brought to the notice of University authorities.
18. For any discrepancies and other relevant matters, decision of the University is final.
19. Upon the completion of the Project, PI should submit final report Form E, Final Financial Statement Form F, and utilization certificate Form G along with true copy of audit report of the Project. In case if principal fails to do so, it will be recovered from institute.

With the following terms conditions to the Principals:

1. The institute where Principal Investigator is working becomes the lead Institute.
2. The grant from TEQIP-III will be transferred to Principals account of lead institution three installments.
3. A separate account for the project may be created.
4. Principal is responsible for transfer of funds to the project account within one week after the release of funds from university. In case if principal fails to do so; it will be recovered from institute.
5. Principals should permit to use existing facilities for project Implementation if requested.
6. In case if both PI and Co-PI-1 are from affiliated institute, a joint account is to be operated by PI, Co -PI-1 and Principal of lead institution
7. In case of collaborative research project carried under twinning, PI and Principal of lead institute will jointly operate the account
8. In case either PI or Co-PI-1 withdraws from the project, Principals of the respective institution shall find the replacement and inform the same to the University for Approval.
9. A declaration form duly signed by Principal (Form H) abiding the rules listed above shall be submitted along with account details within 3 days after receiving the sanction letter for the transfer of research grant.
10. Any discrepancy with PI and Co- PI, while implementing the project, to be communicated with details, to the University.
11. After the completion of every project, Principals of lead institute should ensure that all non consumables procured for projects become the property of institution and to be labeled TEQIP-III/ (Number).
12. Principal of the lead institute should submit the list of all non consumables procured for all Projects at the end of collaborative research scheme through duly filled in Form I.
13. Principals will be informed if any directions from NPIU or changes in guidelines made by TEQIP-III JNTUH relevant to the Collaborative Research Scheme from time to time. Those guidelines should be followed in due course of time, till the completion of TEQIP-III Project
14. For any discrepancies and other relevant matters, decision of the University is final.

Under the circumstances as stated above, the Vice-Chancellor is pleased to accord permission to award the project under Collaborative Research Scheme TEQIP-III, JNTUH.

The expenditure shall be met from TEQIP-III funds.

To
The Concerned Investigators
The Concerned Principals,
Copy to VC/Rector/Registrar.
Copy to Office of the TEQIP-III

[Handwritten Signature]

REGISTRAR

[Handwritten Initials]

[Handwritten Signature]
PRINCIPAL

Geethanjali College of Engg. and Tech.
Cheerla (V), Keerana (M), Medchal Dist.(T.S.)-501 301.

Phone: Off: +91-40-23158665
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Kukatpally, Hyderabad – 500 085, Telangana (India)

PROJECT COMPLETION CERTIFICATE

SUB: - Project completion certificate – refund of unspent balance upon submission of Utilization Certificate.

Sir/Madam,

It is acknowledged that the project sanctioned to

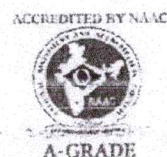
1. **Dr. Rashmi Kapoor**, VNR Vignana Jyothi Institute of Engineering & Technology
2. **Dr. M. Sushama**, JNTUH College of Engineering Hyderabad
3. **Dr.M. Aruna Bharathi**, Geethanjali College of Engineering & Technology

With Procs No.JNTUH/TEQIP-III/CRS/2019/EEE/07 dated on 22-07-2019 under collaborative Research scheme; TEQIP-III JNTUH is completed 30-03-2021. Out of the sanctioned amount of Rs 2,47,462/-, utilized (including Interest) amount is Rs 2,47,462/- and unspent amount for Rs NIL is refunded. In this connection Utilization certificate is submitted by Investigators in compliance to the above.

Swe

PRINCIPAL
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Cheerla (V), Keerana (M), Medchal Dist. (T.S.)-501 301.

[Signature]
REGISTRAR
[Signature]



PROCEEDING OF THE
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

(Established by Govt. Act No. 30 of 2008)

Kukatpally, Hyderabad – 500 085, Telangana (India)

PRESENT Dr. N. YADIAH REGISTRAR

Procs No.JNTUH/TEQIP-III/CRS/2019/CSE/07

Date:22/07/2019

Subject: Award of the project titled “Machine Learning Approach For Plant Disease Identification using Leaf Images” under Collaborative Research Scheme, TEQIP-III, JNTUH.

Read: Note order of the Vice-Chancellor dated 22.07.2019


ORDERS:

The project titled “Machine Learning Approach For Plant Disease Identification using Leaf Images” is awarded with sanctioned amount of Rs Rs.2,95,000/- (Rupees Two Lakh Ninety Five Thousand Only) under Collaborative Research Scheme, TEQIP-III, JNTUH to the following investigators.

- | | |
|--------------------------------|--|
| 1. Principal Investigator | Dr. Ch. Ramesh Babu |
| Department Name | Computer Science and Engineering |
| Institute Name | Geethanjali College of Engineering & Technology |
| 2. Co-Principal Investigator-1 | Dr. Damavalam Srinivasa Rao |
| Department Name | Information Technology |
| Institute Name | VNR Vignana Jyothi Institute of Engineering & Technology |
| 3. Co-Principal Investigator-2 | V.Sravan Kiran |
| Department Name | Information Technology |
| Institute Name | St.Martin's Engineering College |

With the following terms and conditions to the Investigators:

1. The institute where Principal Investigator is working becomes the lead Institute.
2. An Initial grant of Rs.1,00,000/- will be released to the account of the principal of lead institute.
3. In case if both PI and Co-PI-1 are from affiliating institutions, a joint account should be operated by PI, Co-PI-1 and Principal of lead institute.
4. If Co-PI-1 is from the Constituent colleges of JNTUH (JNTUHCEH, JNTUHCEJ, JNTUHCEM, JNTUHCES), PI and Co-PI will operate a Joint account and fund will be transferred for lead institute Principal account.
5. In case, PI or Co-PI leave the institute for any reason or withdraw from the project (proper justification should be communicated to the University), he/she shall be treated as withdrawn from the project.
6. PI's and Co-PI's should fill the Forms A to F and submit to TEQIP-III JNTUH whenever required.
7. PI's and Co-PI's should submit Form A within 3 days after receiving the sanction letter.
8. PI's and Co-PI's should be present at the time of first Progress evaluation after 4 months and all other subsequent Progress Evaluations (once in 4 months) conducted at TEQIP-III JNTUH.
9. The Second Installment of Rs.1,00,000 of Research grant will be released on satisfactory performance in first Progress Evaluation and submission of Form B and Form D duly filled and signed.
10. The 3rd and final installment will be released upon submission of Form C and D and satisfactory Performance in the next Progress Evaluation.


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11. The project should results in at least one publication in the relevant Journal national/international (Non Payment Journal).
12. PI's and Co-PI's will be informed if there are any directions from NPIU or changes made by TEQIP-III JNTUH relevant to Collaborative Research Scheme time to time and are to be followed in due course till the completion of TEQIP-III Project
13. All non-consumables procured for the research project will automatically become the property of the lead institution after completion of the project.
14. Any deviation in the expenditure as defined in the project proposal is not accepted. In such case prior permission is necessary from the university. After obtaining necessary permission, funds should be utilized as per the revised guidelines. No deviation is accepted.
15. Any interest incurred should be deposited back to the university JNTUH, TEQIP-III Account.
16. Unspent amount as per the proposal/ Guidelines of the TEQIP within the stipulated time should be deposited back to the university TEQIP account. (Along with Interest Incurred).
17. Any discrepancy with Co Investigator and principals while implementing the project to be brought to the notice of University authorities.
18. For any discrepancies and other relevant matters, decision of the University is final.
19. Upon the completion of the Project, PI should submit final report Form E, Final Financial Statement Form F, and utilization certificate Form G along with true copy of audit report of the Project. In case if principal fails to do so, it will be recovered from institute.

With the following terms conditions to the Principals:

1. The institute where Principal Investigator is working becomes the lead Institute.
2. The grant from TEQIP-III will be transferred to Principals account of lead institution three installments.
3. A separate account for the project may be created.
4. Principal is responsible for transfer of funds to the project account within one week after the release of funds from university. In case if principal fails to do so; it will be recovered from institute.
5. Principals should permit to use existing facilities for project Implementation if requested.
6. In case if both PI and Co-PI-1 are from affiliated institute, a joint account is to be operated by PI, Co -PI-1 and Principal of lead institution
7. In case of collaborative research project carried under twinning, PI and Principal of lead institute will jointly operate the account
8. In case either PI or Co-PI-1 withdraws from the project, Principals of the respective institution shall find the replacement and inform the same to the University for Approval.
9. A declaration form duly signed by Principal (Form H) abiding the rules listed above shall be submitted along with account details within 3 days after receiving the sanction letter for the transfer of research grant.
10. Any discrepancy with PI and Co- PI, while implementing the project, to be communicated with details, to the University.
11. After the completion of every project, Principals of lead institute should ensure that all non consumables procured for projects become the property of institution and to be labeled TEQIP-III/ (Number).
12. Principal of the lead institute should submit the list of all non consumables procured for all Projects at the end of collaborative research scheme through duly filled in Form I.
13. Principals will be informed if any directions from NPIU or changes in guidelines made by TEQIP-III JNTUH relevant to the Collaborative Research Scheme from time to time. Those guidelines should be followed in due course of time, till the completion of TEQIP-III Project
14. For any discrepancies and other relevant matters, decision of the University is final.

Under the circumstances as stated above, the Vice-Chancellor is pleased to accord permission to award the project under Collaborative Research Scheme TEQIP-III, JNTUH.

The expenditure shall be met from TEQIP-III funds.

[Handwritten Signature]

REGISTRAR

To
The Concerned Investigators
The Concerned Principals,
Copy to VC/Rector/Registrar.
Copy to Office of the TEQIP-III

PRINCIPAL
Goethanjan College of Engg. and Tech.
Cheerayal (V), Keesara (M), Madhwal Dist. (T.S.)-501 301.



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(Established by Govt. Act No. 30 of 2008)

Kukatpally, Hyderabad – 500 085, Telangana (India)

PRESENT Dr. N. YADIAH REGISTRAR

Procs No..JNTUH/TEQIP-III/CRS/2019/ Chemistry/04

Date:25/09/2019

Subject: Award of the project titled “**A facile synthesis and anticancer activity of novel quinoxaline-2-carbohydrazide N-oxide derivatives.**” under Collaborative Research Scheme, TEQIP-III, JNTUH.

Read: Note order of the Vice-Chancellor dated 17.09.2019

ORDERS:

The project titled “**A facile synthesis and anticancer activity of novel quinoxaline-2-carbohydrazide N-oxide derivatives.**” is awarded with sanctioned amount of Rs.2,50,000/- (Rupees Two lakhs fifty thousand only) under Collaborative Research Scheme, TEQIP-III, JNTUH to the following investigators.

1. Principal Investigator : **Dr.K.Shashikala**
Department Name : Chemistry
Institute Name : Geethanjali College of Engineering & Technology
2. Co-Principal Investigator-1 : **Dr.T. Thirumala Chary**
Department Name : Chemistry
Institute Name : JNTUH College of Engineering Hyderabad
3. Co-Principal Investigator-2 : **Dr.S.Srilatha**
Department Name : Chemistry
Institute Name : ACE Engineering College

With the following terms and conditions to the Investigators:

1. The institute where Principal Investigator is working becomes the lead Institute.
2. An Initial grant of Rs.1,00,000/- will be released to the account of the principal of lead institute.
3. A joint account should be operated by PI, Co-PI-1 and Principal of lead institute.
4. In case, PI or Co-PI leave the institute for any reason or withdraw from the project (proper justification should be communicated to the University), he/she shall be treated as withdrawn from the project.
5. PI's and Co-PI's should fill the Forms A to F and submit to TEQIP-III JNTUH whenever required.
6. PI's and Co-PI's should submit Form A within 3 days after receiving the sanction letter.
7. PI's and Co-PI's should be present at the time of first Progress evaluation after 4 months and all other subsequent Progress Evaluations (once in 4 months) conducted at TEQIP-III JNTUH.
8. The Second Installment of Rs.50,000 of Research grant will be released on satisfactory performance in first Progress Evaluation and submission of Form B and Form D duly filled and signed.
9. The 3rd and final installment will be released upon submission of Form C and D and satisfactory Performance in the next Progress Evaluation.
10. The project should results in at least one publication in the relevant Journal national/international (Non Payment Journal).
11. PI's and Co-PI's will be informed if there are any directions from NPIU or changes made by TEQIP-III JNTUH relevant to Collaborative Research Scheme time to time and are to be followed in due course till

PRINCIPAL
Geethanjali College of Engg. and Tech.
Cheeryal (V), Keesara (M), Medchal Dist.(T.S.)-501 301.

12. All non-consumables procured for the research project will automatically become the property of the lead institution after completion of the project.
13. Any deviation in the expenditure as defined in the project proposal is not accepted. In such case prior permission is necessary from the university. After obtaining necessary permission, funds should be utilized as per the revised guidelines. No deviation is accepted.
14. Any interest incurred should be deposited back to the university JNTUH, TEQIP-III Account.
15. Unspent amount as per the proposal/ Guidelines of the TEQIP within the stipulated time should be deposited back to the university TEQIP account. (Along with Interest Incurred).
16. Any discrepancy with Co Investigator and principals while implementing the project to be brought to the notice of University authorities.
17. For any discrepancies and other relevant matters, decision of the University is final.
18. Upon the completion of the Project, PI should submit final report Form E, Final Financial Statement Form F, and utilization certificate Form G along with true copy of audit report of the Project. In case if principal fails to do so, it will be recovered from institute.

With the following terms conditions to the Principals:

1. The institute where Principal Investigator is working becomes the lead Institute.
2. The grant from TEQIP-III will be transferred to Principals account of lead institution in three installments.
3. A separate account for the project may be created.
4. Principal is responsible for transfer of funds to the project account within one week after the release of funds from university. In case if principal fails to do so, it will be recovered from institute.
5. Principals should permit to use existing facilities for project Implementation if requested.
6. In case if both PI and Co-PI-1 are from affiliated institute, a joint account is to be operated by PI, Co -PI-1 and Principal of lead institution
7. In case of collaborative research project carried under twinning, PI and Principal of lead institute will jointly operate the account
8. In case either PI or Co-PI-1 withdraws from the project, Principals of the respective institution shall find the replacement and inform the same to the University for Approval.
9. A declaration form duly signed by Principal (Form H) abiding the rules listed above shall be submitted along with account details within 3 days after receiving the sanction letter for the transfer of research grant.
10. Any discrepancy with PI and Co- PI, while implementing the project, to be communicated with details, to the University.
11. After the completion of every project, Principals of lead institute should ensure that all non consumables procured for projects become the property of institution and to be labeled TEQIP-III/ (Number).
12. Principal of the lead institute should submit the list of all non consumables procured for all Projects at the end of collaborative research scheme through duly filled in Form I.
13. Principals will be informed if any directions from NPIU or changes in guidelines made by TEQIP-III JNTUH relevant to the Collaborative Research Scheme from time to time. Those guidelines should be followed in due course of time, till the completion of TEQIP-III Project
14. For any discrepancies and other relevant matters, decision of the University is final.

Under the circumstances as stated above, the Vice-Chancellor is pleased to accord permission to award the project under Collaborative Research Scheme TEQIP-III, JNTUH.

The expenditure shall be met from TEQIP-III funds.

M. Srinivas
REGISTRAR

To
The Concerned Investigators
The Concerned Principals, of lead Institute

Copy to PA to VC/Rector/Registrar.
Copy to Office of the TEQIP-III

S. Srinivas
PRINCIPAL
Geethanjali College of Engg. and Tech.
Cheeryal (V), Keesara (M), Medchal Dist.(T.S.)-501 301.

Phone: Off: +91-40-23158665
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Web : www.jntuh.ac.in
E Mail: jntuhteqip@jntuh.ac.in



OFFICE OF THE TEQIP - III
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(Established by Govt. Act No.30 of 2008)
Kukatpally, Hyderabad – 500 085, Telangana (India)

PROJECT COMPLETION CERTIFICATE

SUB: - Project completion certificate – refund of unspent balance upon submission of Utilization Certificate.

Sir/Madam,

It is acknowledged that the project sanctioned to

1. **Dr.K.Shashikala**, Geethanjali College of Engineering & Technology
2. **Dr.T. Thirumala Chary**, JNTUH College of Engineering Hyderabad

With Procs No.JNTUH/TEQIP-III/CRS/2019/Chemistry/04 dated on 24-09-2019 under collaborative Research scheme; TEQIP-III JNTUH is completed 31-03-2021. Out of the sanctioned amount of Rs 2,50,000/-, utilized (including Interest) amount is Rs 2,51,379 /- and unspent amount for Rs 60/- is refunded. In this connection Utilization certificate is submitted by Investigators in compliance to the above.

REGISTRAR

PRINCIPAL
Geethanjali College of Engg. and Tech.
Cheeryal (V), Keesara (M), Medchal Dist.(T.S.)-501 301.



PROCEEDING OF THE
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

(Established by Govt. Act No. 30 of 2008)

Kukatpally, Hyderabad - 500 085, Telangana (India)

PRESENT DR. N. YADAVAH REGISTRAR

Proc. No. JNTUH/TEQIP-III/CRS/2019/ Mathematics/04

Date: 25/09/2019

Subject: Award of the project titled "Peristaltic Transport of Nanofluids" under Collaborative Research Scheme, TEQIP-III, JNTUH

Read: Note order of the Vice-Chancellor dated 17/09/2019

ORDERS.

The project titled "Peristaltic Transport of Nanofluids" is awarded with sanctioned amount of Rs. 2,00,000/- (Rupees Two lakhs only) under Collaborative Research Scheme, TEQIP-III, JNTUH to the following investigators.

1. Principal Investigator : **Dr. N.Subadra**
Department Name : Mathematics
Institute Name : Geethanjali College of Engineering & Technology
2. Co-Principal Investigator-1 : **Dr. M.A.Srinivas**
Department Name : Mathematics
Institute Name : JNTUH College of Engineering Hyderabad
3. Co-Principal Investigator-2 : **Dr. Sunil Dutt Purohit**
Department Name : Mathematics
Institute Name : Rajasthan Technical University

With the following terms and conditions to the Investigators:

1. The institute where Principal Investigator is working becomes the lead Institute.
2. An Initial grant of Rs. 1,00,000/- will be released to the account of the principal of lead institute.
3. A joint account should be operated by PI, Co-PI-1 and Principal of lead institute.
4. In case, PI or Co-PI leave the institute for any reason or withdraw from the project (proper justification should be communicated to the University), he/she shall be treated as withdrawn from the project.
5. PI's and Co-PI's should fill the Forms A to F and submit to TEQIP-III JNTUH whenever required.
6. PI's and Co-PI's should submit Form A within 3 days after receiving the sanction letter.
7. PI's and Co-PI's should be present at the time of first Progress evaluation after 4 months and all other subsequent Progress Evaluations (once in 4 months) conducted at TEQIP-III JNTUH.
8. The Second Installment of Rs. 50,000 of Research grant will be released on satisfactory performance in first Progress Evaluation and submission of Form B and Form D duly filled and signed.
9. The 3rd and final installment will be released upon submission of Form C and D and satisfactory Performance in the next Progress Evaluation.
10. The project should results in at least one publication in the relevant Journal national/international (Non Payment Journal).
11. PI's and Co-PI's will be informed if there are any directions from NPIU or changes made by TEQIP-III JNTUH relevant to Collaborative Research Scheme time to time and are to be followed in due course till the completion of TEQIP-III Project


PRINCIPAL
Geethanjali College of Engg. and Tech.
Cheerla (V), Keasara (M), Medchal Dist.(T.S.)-501 304.

12. All non-consumables procured for the research project will automatically become the property of the lead institution after completion of the project.
13. Any deviation in the expenditure as defined in the project proposal is not accepted. In such case prior permission is necessary from the university. After obtaining necessary permission, funds should be utilized as per the revised guidelines. No deviation is accepted.
14. Any interest incurred should be deposited back to the university JNTUH, TEQIP-III Account.
15. Unspent amount as per the proposal/ Guidelines of the TEQIP within the stipulated time should be deposited back to the university TEQIP account. (Along with Interest Incurred).
16. Any discrepancy with Co Investigator and principals while implementing the project to be brought to the notice of University authorities.
17. For any discrepancies and other relevant matters, decision of the University is final.
18. Upon the completion of the Project, PI should submit final report Form E, Final Financial Statement Form F, and utilization certificate Form G along with true copy of audit report of the Project. In case if principal fails to do so, it will be recovered from institute.

With the following terms conditions to the Principals:

1. The institute where Principal Investigator is working becomes the lead Institute.
2. The grant from TEQIP-III will be transferred to Principals account of lead institution in three installments.
3. A separate account for the project may be created.
4. Principal is responsible for transfer of funds to the project account within one week after the release of funds from university. In case if principal fails to do so, it will be recovered from institute.
5. Principals should permit to use existing facilities for project Implementation if requested.
6. In case if both PI and Co-PI-1 are from affiliated institute, a joint account is to be operated by PI, Co -PI-1 and Principal of lead institution
7. In case of collaborative research project carried under twinning, PI and Principal of lead institute will jointly operate the account
8. In case either PI or Co-PI-1 withdraws from the project, Principals of the respective institution shall find the replacement and inform the same to the University for Approval.
9. A declaration form duly signed by Principal (Form H) abiding the rules listed above shall be submitted along with account details within 3 days after receiving the sanction letter for the transfer of research grant.
10. Any discrepancy with PI and Co- PI, while implementing the project, to be communicated with details, to the University.
11. After the completion of every project, Principals of lead institute should ensure that all non consumables procured for projects become the property of institution and to be labeled TEQIP-III/ (Number).
12. Principal of the lead institute should submit the list of all non consumables procured for all Projects at the end of collaborative research scheme through duly filled in Form I.
13. Principals will be informed if any directions from NPIU or changes in guidelines made by TEQIP-III JNTUH relevant to the Collaborative Research Scheme from time to time. Those guidelines should be followed in due course of time, till the completion of TEQIP-III Project
14. For any discrepancies and other relevant matters, decision of the University is final.

Under the circumstances as stated above, the Vice-Chancellor is pleased to accord permission to award the project under Collaborative Research Scheme TEQIP-III, JNTUH.

The expenditure shall be met from TEQIP-III funds.

To
The Concerned Investigators
The Concerned Principals, of lead Institute

Copy to PA to VC/Rector/Registrar.
Copy to Office of the TEQIP-III


REGISTRAR


PRINCIPAL
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Cheeryl (V), Keasara (M), Medchal Dist.(T.S.)-501 301.

FORM G
(Final Financial Statement)

1. Sanction letter no.

Proc No. INTU/IT/TEQIP/IT/CRS/2019/Mathematics/04

2. Total Project Cost Rs. 2,00,000

Sanction Revised Project cost (if applicable) Rs. 2,00,000

3. Date of Commencement of Project 17/09/2019

4. Date of completion of project 28/02/2021

5. Grant revised in each year (financial)

Sl No.	Sanctioned Heads	Funds Allocated (Rs.)	Balance (if any)			Remarks			
			I Installment	II Installment	III Installment	Total			
1	2	3	4	5	6	7	8	9	10
1.	Manpower	30,000	15,000	15,000	-		30,000		
2.	Non-Consumables	60,000	19,967	40,033	-		60,000		
3.	Consumables								
4.	Travel	20,000	20,000	-	-		20,000		
5.	Field Visit	20,000	6717	-	13283		20,000		
6.	Overhead Expenses	40,000	10,000	-	30,000		40,000		
7.	Others (if any)	30,000	7,090	20,312	806+817+3600=5223		32,625		
8.	Bank Charges				262		262		
	Total	2,00,000	78,774	75,345	48,768		2,02,887.00		

Amount to be refunded/ reimbursed (whichever is appropriate): Nil

Signature of the:

a) Principal Investigator: *S. Subh*

b) Co-Investigator-I: *M. S. S. S.*

c) Co-Investigator-II



Signature of the Head of the Institution with Seal

PRINCIPAL

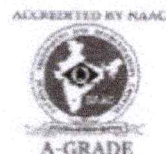
Geethanjali College of Engg. and Tech.

Cheeryal (V), Keesara (M), Medchal Dist.(T.S.)-501 301

PRINCIPAL

Geethanjali College of Engg. and Tech.
Cheeryal (V), Keesara (M), Medchal Dist.(T.S.)-501 301.

Phone: Off +91-40-23158665
Fax: +91-40-23158665
Web: www.jntuh.ac.in
E Mail: pa2registrar@jntuh.ac.in



PROCEEDING OF THE
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
(Established by Govt. Act No. 30 of 2008)
Kukatpally, Hyderabad – 500 085, Telangana (India)
PRESENT Dr. N. YADIAH REGISTRAR

Procs No.JNTUH/TEQIP-III/CRS/2019/ECE/07

Date:22/07/2019

Subject: Award of the project titled “Speech Enabled IVR based online market place for Farmers” under Collaborative Research Scheme, TEQIP-III, JNTUH.

Read: Note order of the Vice-Chancellor dated 22.07.2019

ORDERS:

The project titled “Speech Enabled IVR based online market place for Farmers” is awarded with sanctioned amount Rs. 2,99,000/- (Rupees Two Lakh Ninety Nine Thousand only) under Collaborative Research Scheme, TEQIP-III, JNTUH to the following investigators.

- | | |
|--------------------------------|---|
| 1. Principal Investigator | D. Mohan |
| Department Name | Electronics and Computer Engineering |
| Institute Name | Sreenidhi Institute of Science & Technology |
| 2. Co-Principal Investigator-1 | Dr. K. Anitha Sheela |
| Department Name | Electronics and Communication Engineering |
| Institute Name | JNTUH College of Engineering Hyderabad |
| 3. Co-Principal Investigator-2 | Mr. P. Sudhakar |
| Department Name | Electronics and Communication Engineering |
| Institute Name | Geethanjali College of Engineering and Technology |

With the following terms and conditions to the Investigators:

1. The institute where Principal Investigator is working becomes the lead Institute.
2. An Initial grant of Rs.1,00,000/- will be released to the account of the principal of lead institute.
3. In case if both PI and Co-PI-1 are from affiliating institutions, a joint account should be operated by PI, Co-PI-1 and Principal of lead institute.
4. If Co-PI-1 is from the Constituent colleges of JNTUH (JNTUHCEH, JNTUHCEJ, JNTUHCEM, JNTUHCES), PI and Co-PI will operate a Joint account and fund will be transferred for lead institute Principal account.
5. In case, PI or Co-PI leave the institute for any reason or withdraw from the project (proper justification should be communicated to the University), he/she shall be treated as withdrawn from the project.
6. PI's and Co-PI's should fill the Forms A to F and submit to TEQIP-III JNTUH whenever required.
7. PI's and Co-PI's should submit Form A within 3 days after receiving the sanction letter.
8. PI's and Co-PI's should be present at the time of first Progress evaluation after 4 months and all other subsequent Progress Evaluations (once in 4 months) conducted at TEQIP-III JNTUH.
9. The Second Installment of Rs.1,00,000 of Research grant will be released on satisfactory performance in first Progress Evaluation and submission of Form B and Form D duly filled and signed.
10. The 3rd and final installment will be released upon submission of Form C and D and satisfactory Performance in the next Progress Evaluation.

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Geethanjali College of Engg. and Tech.
Cheerla (V), Keesara (M), Medchal Dist.(T.S.)-501 301.

Phone: Off: +91-40-23158665
Fax: 191-40-23158665
Web : www.jntuh.ac.in
E Mail: jntuhreqip@jntuh.ac.in



OFFICE OF THE TEQIP - III
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
(Established by Govt. Act No.30 of 2008)
Kukatpally, Hyderabad – 500 085, Telangana (India)

PROJECT COMPLETION CERTIFICATE

SUB: - Project completion certificate – refund of unspent balance upon submission of Utilization Certificate.

Sir/Madam,

It is acknowledged that the project sanctioned to

1. **D. Mohan**, Sreenidhi Institute of Science & Technology
2. **Dr. K. Anitha Sheela**, JNTUH College of Engineering Hyderabad
3. **Mr. P. Sudhakar**, Geethanjali College of Engineering and Technology

With Procs No. JNTUH/TEQIP-III/CRS/2019/ECE/07 dated on 22-07-2019 under collaborative Research scheme; TEQIP-III JNTUH is completed. Out of the sanctioned amount of Rs 2,99,000/-, utilized amount (including Interest) is Rs 3,01,061/- and unspent amount for Rs NIL is refunded. In this connection Utilization certificate is submitted by Investigators in compliance to the above.


REGISTRAR



PRINCIPAL
Geethanjali College of Engg. and Tech.
Cheeryal (V), Keesara (M), Medakal Dist.(T.S.)-501 301.

Tele:
Tele Fax:



No. ERIP/ER/1504754/M/01/1719
Government of India, Ministry of Defence
Defence Research & Development Orgn.
Directorate of Extramural Research and
Intellectual Property Rights
DRDO HQ Annexe
5th Floor, NTB, Metcalfe House
Delhi -110054

5th August, 2021

To

Prof S Udaya Kumar
Dept. of ECE
Geethanjali College of Engineering and Technology
Cheeryal (V), Keesara (M), Medchal Dist. (T.S.) – 501 301

Corrigendum

Sub: PDC Extension of ER&IPR Sponsored Grant-in-Aid Project Titled "Development of Novel Carbon Nanotube/Polymer Nanocomposite Materials for EMI Applications"

- Ref: (i) Sanction Letter No. ERIP/ER/1504754/M/01/1719 dated 2nd April, 2018
(ii) PI request letter dated 29.06.2021 for PDC Extension of 08 months
(iii) Recommended by PRC Meeting held on 28th January, 2021

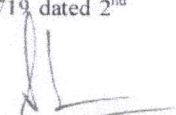
The competent authority has granted PDC extension up to 19.03.2022 (08 months).
The following amendment is made in sanction letter dated 2nd April, 2018:-

Para 3 of sanction letter dated 2nd April, 2018

FOR: "The project will last for 03 Years from the date of release of the first installment by the PCDA (R&D) and it will be governed by the terms and conditions given overleaf"

READ: "The project will last for 03 Years & 08 Months from the date of release of the first installment by the PCDA (R&D) and it will be governed by the terms and conditions given overleaf"

2. All other terms and conditions, as mentioned in the sanction letter no ERIP/ER/1504754/M/01/1719 dated 2nd April, 2018 remains unchanged.


(Dr Shiv Kumar)
Director, ER&IPR

Copy to:

1. The Principal, Geethanjali College of Engineering and Technology, Cheeryal (V), Keesara (M), RR District- 501 301, Telangana
2. The Director, DMSRDE, DRDO, GT Road, Kanpur- 208 013
3. Sh Alok Dixit, Sc'F', DMSRDE, DRDO, GT Road, Kanpur- 208 013
4. PCDA (R&D), DRDO Cell, RK Puram, New Delhi-110 066
5. IFA (R&D), DRDO Bhawan, New Delhi-110 011
6. DGADS, L-2 Block, New Delhi- 110 001



PRINCIPAL
Geethanjali College of Engg. and Tech.
Cheeryal (V), Keesara (M), Medchal Dist.(T.S.)-501 301.

AUDITED/PROVISIONAL STATEMENT OF EXPENDITURE ACCOUNTS

FOR THE FINANCIAL YEAR 2019-2020 (1-4-2019 to 31-3-2020)

- (a) Title of the Project: Development of Novel carbon nanotube/polymer nanocomposite materials for EMI applications
 (b) Sanctioned letter no. & date: ERIP/ER/1504754/M/01/1719, Date: 2-4-2018
 (c) Principal Investigator: Prof. S. Udaya Kumar
 (d) Date of Start of the Project: 20-7-2018
 (e) Total Sanctioned cost of the Project :in Rs.45.81 lakh
 (f) Grant received (Rs.) in I yr. Rs.30.39 lakh II yr III yr
 (g) Total Grants received so far: Rs.30.39 lakh

S. No.	Sanctioned Heads	Funds Sanctioned for the year Rs. lakh	Funds released Rs. lakh	Carried forward from Previous year Rs.	Funds available (iv+ v) Rs	Expenditure incurred during the FY Rs.	Balance (vi-vii) Rs.	Commitments Rs.	Total expenditure (vii+ix) Rs.
i	ii	iii	iv	v	vi	vii	viii	ix	x
(a)	Staff	3.90	--	1,53,065	1,53,065	3,90,000	-2,36,935	3,90,000	7,80,000
(b)	Equipment	--	--	9,71,159	9,71,159	9,18,500	52,659	52,659	9,71,159
(c)	Operation & Maint.	--	--	--	--	--	--	--	--
(d)	Expendables	2.50	--	1,18,815	1,18,815	96,860	21,955	2,71,955	3,68,815
(e)	Travel	0.50	--	41,974	41,974	29,828	12,146	62,146	91,974
(f)	Contingencies	0.40	--	30,879	30,879	46,895	-16,016	56,016	1,02,911
(g)	Research Consultant	0.29	--	29,000	29,000	--	29,000	29,000	29,000
(h)	Procured Service	--	--	--	--	--	--	--	--
	Institutional over head	0.39	--	70,273	70,273	70,273	--	39,000	84,273
	Interest earned, (during 1/4/2018 to 31/03/2019)	--	--	44,641	44,641	80,575 (Interest from 20/7/2018 to 31/10/2019 Refunded to CDA (R&E)) Vide cheque no 499507 Date 27/11/2019)	8,958	8,958	89,533
	Interest earned during 1/4/2019 to 31/03/2020	--	--	--	44,892	--	--	--	--
	TOTAL	7.98	--	14,59,806	15,04,698	16,32,931	-1,28,233	9,09,734	25,17,665

S. Udaya Kumar
 Name and Signature of Principal Investigator
 Date:

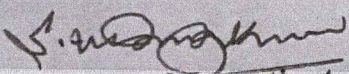
R. MALESAN
 Name and Signature of Accounts Officer
 Date:

S. Udaya Kumar
 Signature of Administrative Authority
PRINCIPAL
 Geethanjali College of Engg. and Tech.

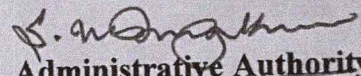
UTILIZATION CERTIFICATE

FY 2019-2020 (From 1-4-2019 to 31-3-2020)

Certified that sum of Rs.30.39 lakh was sanctioned as grants-in-aid during the Year 2018-2019 in favour of Geethanjali College of Engineering and Technology. Instt) vide DRDO letter No. ERIP/ER/1504754/M/01/1719 dated 2-4-2018. A sum of Rs. 30.39 lakh released vide Letter No. ERIP/ER/1504754/M/01/1719 dated 26-7-2018, an amount of Rs. 44,892 /- accrued as interest (if any) during the year and Rs. 14,59,806./- on account of unspent balance of the previous year, a sum of Rs. 16,32,931. /- has been utilized for the purpose of which it was sanctioned and that the balance of Rs. -1,28,233 /- (to be paid) at the end of the year shall be adjusted towards the grants-in-aid payable during the year i.e. 2020-21


Principal Investigator


Accounts/Finance Officer

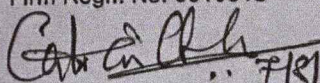

Administrative Authority
(with official seal)

PRINCIPAL
Geethanjali College of Engg. and Tech.
Cheeryal (V), Keesara (M), R.R.Dist. (A.P.)-501 301.

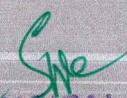
2. Certified that I have satisfied myself that the conditions on which the grants- in-aid was sanctioned have been fulfilled/are being fulfilled and that I have exercised the following checks to see that the money was actually utilized for the purpose for which it was sanctioned.

UDIN: 2002236/AAAACT4581

For HARI BABU & ASSOCIATES
CHARTERED ACCOUNTANTS
Firm Regn. No. 001064S

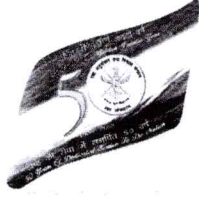

(Ch. HARI BABU) Partner
M. No. 022361
7/12/2020

Signature of Audit Authority of
Grantee Institution


PRINCIPAL
Geethanjali College of Engg. and Tech.
Cheeryal (V), Keesara (M), Medchal Dist.(T.S.)-501 301.

GCET/113/2019-20, Dt. 12-03-2020

SPEED POST



सूक्ष्मतरंग नलिका अनुसंधान तथा विकास केन्द्र
पी ओ बाक्स -1310, जालहल्ली पोस्ट, बेंगलूरु - 560013, कर्नाटक, भारत

Microwave Tube Research and Development Centre (MTRDC)
P.O. Box No.1310, Jalahalli P.O., Bengalooru -560 013, Karnataka, India

EPABX : 28382402 / 1155 / 6807 / 0388
Grams : DEFMICROTUBE

Telefax : 080-28386809
Web : www.drdo.org

Fax : 080-28386809 / 1750 / 6804
E-mail : mmg@mtrdc.drdo.in

रक्षा अनुसंधान तथा विकास संगठन, रक्षा मंत्रालय, भारत सरकार Defence Research & Development Organisation, Ministry of Defence, Government of India

No. MTRDC/MMG/171111/LPO/134/2018-19/BUP

Date: 05 Mar, 2020

To,

M/s. Geethanjali College of Engineering and technology
Sy No.33 & 34, Cheeryal (V),
Keesara (M),
Medchal District,
Telangana – 501 301

(Kind Attn. Prof. Dr. S. UDAYA KUMAR)

SUBJECT: PAYMENT DOCUMENTS IN R/O CARD CONTRACT ON "DESIGN AND SOLENOID MAGNET SYSTEMS FOR BACKWARD WAVE OSCILLATOR"

Reference: Your letter dated: 24.02.2020

1. With reference to your above said letter, the Invoice is not enclosed along with the contractor's bill and other documents. Payment cannot be processed without the Invoice. *Also please attach ECs PAN card & cancelled cheque*
2. Kindly forward the same at the earliest.

[Signature]
(S VIJAY MAHENDRA)
STORES OFFICER
FOR DIRECTOR

17004
To
Dr. R.S. Raju
[Signature]
13/03

कृपया सदैव उत्तर देते समय हमारी पत्र संख्या तथा दिनांक लिखें। यह आपके पत्र संचार के उत्तर देने में अधिक सहायता देगी।
Kindly always quote our letter number and date while replying. This will immensely assist prompt attention to your communication.

ISO 9001: 2000 Certified



[Signature]
PRINCIPAL
Geethanjali College of Engg. and Tech.
Cheeryal (V), Keesara (M), Medchal Dist.(T.S.)-501 301.

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सूक्ष्मतरंग नलिका अनुसंधान तथा विकास केन्द्र
बी.ई.एल. कांप्लेक्स, जालहल्ली, बेंगलूरु -560013

Microwave Tube Research and Development Centre
BEL Complex, Jalahalli, Bangalore-560013, Karnataka
EPABX: 28380388/28382402 Fax: 28381750/28386804/28386809 Web: <http://drdo.gov>

युवा अनुसंधान तथा विकास संगठन, रक्षा मंत्रालय, भारत सरकार Defence Research & Development Organization, Ministry of Defence, Government of India

Letter No: MTRDC/10731/CARS/01

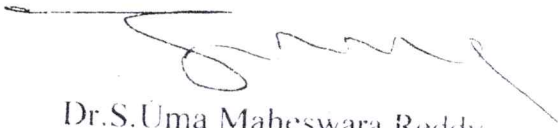
Date: 25/08/2020

To
The principal
Geethanjali College of Engineering and Technology
Cheeryal (V), Medchal (D), Telangana

Subject: Letter of completion of project

Dear Sir

We are glad to state that the involvement of your college in the "Design and development of solenoid magnet for BWO" CARA project strengthen our R&D activity on our development program of BWO. We appreciate your design work, which is to our satisfaction. We hope to see your further involvement in future to support our R&D work through a suitable programme.


Dr. S. Uma Maheswara Reddy
OS & Director

EPABX: 28380388, 28381155, 28382402, 28386807 Fax: 080-28381750/28386804/28386809
Web: www.drdo.org E-mail: director@mtrdc.drdo.in

ISO 9001 : 2008




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Geethanjali College of Engg. and Tech.
Cheeryal (V), Keerasa (M), Medchal Dist. (T.S.)-501 301.

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Date Voucher Cheq. No Branch Account Debit Credit Balance Narration

DRDO Sponsored Project-MTRDC(CARS)	Number	R no	Amount	Amount	Account	Debit	Credit	Balance	Narration
					Opening Balance			135,400.00	
04-22-2019		Pmt:230	142485		SBI Bank -a/c(PGCET-62079625817)	4,000.00		139,400.00	Towards Paid to Dr.K.Sai Krishna for MTRDC Project Guest Honarar
04-30-2019		Jrn:35			Salaries Account			170,400.00	Towards Staff Salaries payable for the Month of APRIL'19
05-09-2019		Pmt:502	142529		SBI Bank -a/c(PGCET-62079625817)	2,000.00		172,400.00	Towards Paid to Sourabh Joshi for MTRDC Project Guest Honarar
05-17-2019		Rct:205		TR	SBI Bank -a/c(PGCET-62079625817)		145,314.00	27,086.00	BULK POSTING CDA RANDD BENGALURU000024
05-31-2019		Jrn:117			Salaries Account			58,086.00	Towards Staff Salaries payable for the Month of MAY'19
05-31-2019		Jrn:1219			TDS/TCS Receivable		16,146.00	41,940.00	Twrds tds receivable on amt 161460/-from CDA-Bangalore
06-20-2019		Pmt:907	225253		SBI Bank -a/c(PGCET-62079625817)	3,000.00		44,940.00	Towards Paid to Jjanardhana Reddy for MTRDC Project Guest Honar
06-20-2019		Pmt:909	225254		SBI Bank -a/c(PGCET-62079625817)	3,000.00		47,940.00	Towards Paid to Ajit Raymond James for MTRDC Project Guest Honar
06-30-2019		Jrn:187			Salaries Account			78,940.00	Towards Staff Salaries payable for the Month of JUNE'19
07-15-2019		Pmt:1249	225306		SBI Bank -a/c(PGCET-62079625817)	2,279.00		81,219.00	Towards Paid to Dr.RS Raju for MTRDCSC Project Work Travelling Ex
07-31-2019		Jrn:263			Salaries Account			112,219.00	Towards Staff Salaries payable for the Month of JULY'19
08-08-2019		Pmt:1537	056415		SBI Bank -a/c(PGCET-62079625817)	7,158.00		119,377.00	Towards Paid for MTRDC Project Purpose Misc Exp Pur (RS RAJU
08-31-2019		Jrn:348			Salaries Account			150,377.00	Towards Staff Salaries payable for the Month of AUGUST'19
09-04-2019		Pmt:1805		ECE	Main Cash Book	1,746.00		152,123.00	Towards Paid for Pur. of MTRDC Project Misc Exp
09-27-2019		Jrn:433			S.V.Electronics Ltd	1,500.00		153,623.00	Towards Inv No:C15-2772 & C15-2740
09-27-2019		Jrn:433			S.V.Electronics Ltd	6,000.00		159,623.00	Towards Inv No:C15-2772 & C15-2740
09-30-2019		Jrn:430			Salaries Account			190,623.00	Towards Staff Salaries payable for the Month of SEPTEMBER'19
10-31-2019		Jrn:521			Salaries Account			221,623.00	Towards Staff Salaries payable for the Month of OCTOBER'19
11-18-2019		Pmt:2656			Main Cash Book	2,969.00		224,592.00	Towards paid for R&D MTRDC Project Purpose Misc Exp
11-18-2019		Pmt:2659			Main Cash Book	1,200.00		225,792.00	Towards paid for R&D MTRDC Project Purpose Misc Exp
11-30-2019		Jrn:629			Salaries Account			256,792.00	Towards Paid for DRDO (R&D) & MTRDC JRF Salary Month of Nov'19
12-31-2019		Jrn:764			Salaries Account			287,792.00	Towards Paid for DRDO (R&D) & MTRDC JRF Salary Month of Dec'19
01-31-2020		Jrn:917			Salaries Account			318,792.00	Towards Paid for DRDO (R&D) & MTRDC JRF Salary Month of Jan'202
03-02-2020		Rct:3496		TR	SBI Bank -a/c(PGCET-62079625817)		217,971.00	100,821.00	BULK POSTING CDA RANDD BENGALURU000024
03-30-2020		Rct:3649		NEFT	SBI Bank -a/c(PGCET-62079625817)		264,285.00	163,464.00	BULK POSTING - CDA RANDD BENGALURU000024
03-31-2020		Jrn:1220			TDS/TCS Receivable		29,365.00	192,829.00	Twrds tds receivable on amt 293650/-from CDA-Bangalore
03-31-2020		Jrn:1221			TDS/TCS Receivable		24,219.00	217,048.00	Twrds tds receivable on amt 242190/-from CDA-Bangalore
			Total (Rup)			480,252.00	697,300.00		

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Compressed Data Aggregation and Routing in WSN using Optimal Clustering Protocol

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Abstract: There is a difference in energy consumption among the nodes in cluster-based wireless sensor networks due to the non-uniform distribution of nodes. Based on this issue, we are proposing an efficient data aggregation tree based on the previous clustering architecture for communication and routing. Here, using fuzzy logic methodology, parameters such as Residual Power, Node Density and Load cluster heads are chosen. The inter-cluster routing algorithm balances the energy consumption between the heads of the cluster by changing energy consumption between clusters. Then data compression is applied using data correlation model to reduce energy consumption.

Keywords: wireless sensor network; fuzzy logic; inter-cluster routing algorithm; energy consumption.

1. Introduction

1.1 Wireless Sensor Networks (WSN)

Wireless Sensor Networks (WSN) consists of intelligent, teensy sensor nodes capable of sensing different types of phenomenon using sensor modules and wirelessly transmitting the specific data to a sink node. WSNs gather and measure all data and provide specific users with different sensing information. Typically, these sensor nodes are installed in huge proportions (from a few to thousands) and in environments where human control is exceedingly difficult. Sensors must therefore be spread randomly and must use limited power storage units such as batteries. Sensor nodes therefore need to work with each other to create a self-organized network, and they need to be fitted with energy-efficient modules and protocols to reduce energy consumption and ensure long life of the network [1].

One of WSN's important tasks is to collect and relay the relevant parameters to the base station. Sensors are typically deployed in a dangerous atmosphere and battery replacement is difficult, making energy usage one of the most important considerations of protocol design. In WSN, sensors share information to each other through wireless signal and all neighbors receive the data transmitted by a sensor, thus the overhead communication is the large energy wastage of the sensor. Data aggregation is among the most effective ways of reducing overhead communication and many schemes for eliminating redundant transmissions have been proposed [2,3].

A sensor network consists of a lot of of sensors with capabilities in computing, communication, and sensing that can spread across a geographical region. Their restricted processing power, range and storage space limits the use of standard data processing algorithms and the amount of intermediate results that can be deposited on the sensor nodes. Thus, well-organized routing in WSNs is needed for the easiest way of compressed data aggregation [4,5].

1.2. Aggregation of cluster-based data in WSN

In the wireless sensor region data aggregation is an important technique because data packet reduction can reduce energy consumption, increase network life, and increase the effective data transmission ratio. The principle of clustering can be used to increase the efficiency of data aggregation in a hierarchical network in terms of target monitoring. Static clustering and the other dynamic clustering are the two types of clustering methods.

Fuzzy K-means clustering with fast density peak clustering on multivariate kernel estimator with evolutionary multimodal optimization clusters on a large dataset


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Multimedia Tools and Applications
An International Journal

ISSN 1380-7501

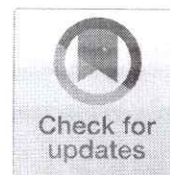
Multimed Tools Appl
DOI 10.1007/s11042-020-09718-4



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Fuzzy K-means clustering with fast density peak clustering on multivariate kernel estimator with evolutionary multimodal optimization clusters on a large dataset

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Received: 19 November 2019 / Revised: 12 August 2020 / Accepted: 25 August 2020
Published online: 01 October 2020
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Abstract

Many conventional optimization approaches concentrate more on addressing only one appropriate solution. Thus, these methods were to be utilized often, hence there were no chances of producing the intended solution. Therefore, the issue of multimodal optimization has to be considered. So, to reduce the difficulties by the clustering and further, it followed by the optimization technique. Here, the variety of real-time and artificial techniques are used. Using the FCDP-Fast Clustering with Density Peak, we calculate the density values after determining the center with the help of objective function. Then, the fuzzy clustering is applied to form the clustered groups with the density and center values. Finally, we optimize the data using the CDE-Crowding Differential Evaluation methodology. Performance analysis is then proceeded with some existing methods by using the performance metrics like NMI and ARI. After validation, it concluded that the proposed method was superior to the existing method.

Keywords K-means clustering · Multimodal optimization · Crowding differential evaluation · Density value · Center distance

1 Introduction

Being the age of internet dominances and rapid technological advancements, we must be safe and sound so that we could escape from the intruders and spammers in the surroundings. So data

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SMART HOME SECURITY ENVIRONMENT SYSTEM ENVIRONMENT WITH HUMAN FACE RECOGNITION BY USING REMOTE TECHNOLOGY

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Abstract: Smart home security system has become indispensable in daily life. Remote monitoring technologies are to be used since the invention of smart home security control system. In this paper, we described home environmental issues to authenticate people by the verification of wireless control system. We proposed verification techniques for the identification of visitors' faces, alert messages of home environment situations. System control issues can be authorized the system through user mobiles by receiving the commands with authentication. The complete system is controlled by using Raspberry Pi and testing the home environment. This new system can be implemented in the home environment to do authentication process. Normally Face recognition algorithms and wireless interfaces are used to identify the visitors and provide an email notification and/or an alert message about the current home environment through network facilities with the help of home owner's mobile phones. This system is more useful for more applications which are not having a physical presence at any time.

Keywords: Face detection, Raspberry pi, E-mail, Security.

1. INTRODUCTION:

Now a days, Internet of Things (IoT) is an emerging area in an IT field. It is a network connection with physical objects which are accessible through the internet facilities. Yet things assign an IP address and collect the data transfer through network without human beings of participation. It provides different ways to increase efficiency and improving safety and it security [1]. Data analytics, security issues have improved the performance to achieve the best results. An efficient embedded door access control management techniques are used in face recognition process. It plays a crucial role in the security application. In those days implementation of security system was implemented in homes and workplaces [2]. Doors are open/close with the cards, security keys. It has the following advantages.

- Small surveillance capacity.
- Low efficiency in evaluating time.
- Human error in high security system.

Recent days, security gains are real high power of everything in the universe. In this paper, the authors have been focused for producing the comprehensive study, which is related to the many door locks and gate security systems that are mainly implemented [3]. Customer can access the system by utilizing mobile phones [10]. Previously some of the authors are focused on security issues. Krishna Reddy et al have focused on security issues in a cloud environment. [16]. Titupathy Reddy et al gives data sharing process by using secret keys. [17]. Swapna et al described the website security threats [18]. Ravindra Nath et al have been focused on different security issues for data in cloud environment [19, 20, 21]. Jabbertal [22] provide a health care management system of government. Lakshmi Praneetha et al [23] demonstrate the automated leaf disease detection in corn species through image analysis. Mishra et al [24] gives performance analysis on architecture issues. Nagendrama [25] provides the Performance evaluation of wide area network issues. The major contribution of the paper is to provide the guidance to the users for improving door security of personal locations by using face detection and verification [1]. This system can be used to develop



Visualization and quantification of aggregate and fiber in self-compacting concrete using computed tomography for wedge splitting test

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Received: 7 March 2020 / Revised: 26 September 2020 / Accepted: 14 October 2020
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Abstract

Wedge splitting test gained popularity as a stable and simple method to predict the fracture mechanism properties of concrete specimens. The present research focuses on understanding the behavior of self-compacting concrete specimens made with and without steel fibers tested using wedge splitting test, later scanned under high resolution computed tomography. The contribution of hooked end steel fiber and coarse aggregates in fiber reinforced specimens was compared without steel fiber reinforced concrete specimens using high resolution computed tomography. As fracture takes place across the plane perpendicular to the splitting force, i.e. along the depth of specimens. High resolution computed tomography technique was adopted in visualizing the changes taking place across the matrix, coarse aggregate and steel fibers, along with the specimen's depth. Datasets of the images, obtained from computed tomography, after images analysis and volume reconstruction, revealed a higher coarse aggregate and steel fiber participation in the failure region of without and with fibers specimens. Computed tomography investigation indicated a total of 23 coarse aggregate and 64 steel fibers participated in resisting the failure, during wedge splitting test of without and with fibers specimens. Therefore, high resolution computed tomography can be used in understanding, quantifying the participation of coarse aggregate and steel fiber in the failure plane, under fracture loads.

Keywords Wedge splitting test · Computed tomography · Self-compacting concrete · Image analysis · Fracture mechanism

1 Introduction

Dearth of free space for construction, led to a spike in land rate. To accommodate the spike in land rates, affordable for people in general, infrastructures projects are built vertically. A civil engineer needs to design such infrastructure projects, with a superior design that require structural members to be slender. In making the designing of such slender sections a reality,

usage of superior engineering materials can't be ignored. These slender sections are reinforced with more number of closely placed steel bars, and then concrete is forced to pass through these reinforcement. The limitation of conventional concrete to access such inaccessible areas without external vibrations is questionable, without forgoing its homogeneity and mechanical properties. Such limitations were solved by self-compacting concrete (SCC) designed by Okamura [1] and later developed by several researchers, incorporating mineral admixtures, fibers and recycled aggregates etc. to enhance mechanical properties and durability. SCC mixes have higher finer particle concentrations, resulting in a highly workable and rich interfacial transition zone (ITZ) interface in harder concrete, relative to conventional concrete [2–4]. Failure mechanisms taking place in concrete are often influenced by the material properties and their proportions adopted during the mix design [5–8], for which SCC is no exception. Since SCC is heterogeneous and quasi brittle material with multiple phases characterisation similar to conventional concrete.

Inherently SCC specimens have cracks or fissures due to heat of hydration, shrinkage cracks etc. at several

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STRENGTH PROPERTIES OF FRC USING GLASS FIBRE AND POLYPROPYLENE

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Abstract:

Concrete is one of the primary materials in a variety of studies in the building industry. In order to increase its properties such as workability, strength, durability and other applications, as well as to reduce production costs, alternatives in concrete are also required in civil technology. Containing the fibrous content, fiber-reinforced concrete (FRC) increases the structural strength of this material. It comprises small, equal sized and randomly-oriented discrete fibres. Fibers include steel, glass fibres, synthetic and natural fibres, each with a range of properties. Furthermore, fiber-reinforced concrete change characteristics with various concretes, fibre materials, geometry, distribution, orientation and permeability. In shotcrete, fibre-reinforcement is used especially but can also be used in regular concrete. Normal fibre reinforced concrete is used mainly for ground floors and floors but can be used for a wide variety of construction sections.

Key words: natural fibres, fiber-reinforced concrete (FRC), polypropylene

1.0 INTRODUCTION

Concrete is the most commonly used construction material in the world. Beta processing includes materials such as cement, fine aggregates, rough aggregates, water and admixtures. The use of concrete grows more rapidly due to infrastructure growth and construction activities. However, the effects on concrete production are negative: continuous mining of aggregates from natural resources, ecological imbalances and deterioration of the environment are responsible. In the construction sector this environmental reason has caused much problem. Since ancient times, fibres have been used for concrete strengthening, although the technology has considerably advanced as is the case in other regions. Stroke and mortar were used in early age for manufacturing mud bricks and horsehair for strengthening them. With the advent of fibre technology, cement was improved in the early 20th siècle by asbestos fibres. In the mid-20th century substantial study has been underway into the use of concrete reinforcement composites.

2.0 LITERATURE REVIEW

Containing synthetic fibers, fiber-reinforced concrete (FRC) enhances structural integrity. It comprises small, uniformly distributed and randomly oriented discrete fibres. The fibres include steel and glass fibres, synthetic and natural fibres, each of which has different characteristics.

Behaviour Of Pedestrians At Mid-Block While Crossing The Road And Recommendations For Providing Exclusive Pedestrian Phase (Epp)At Those Locations.

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Abstract: Pedestrian crossing and the behavior of pedestrians in different conditions especially at uncontrolled crossings is a subject which needs in depth study and analysis. At uncontrolled junctions, the pedestrians and their behavior, safety of pedestrian crossing is neglected and no measures are taken to systematize pedestrian crossings at these junctions. Therefore a practical study of the pedestrian road crossing data is made in this study and statistical analysis of the data is done at uncontrolled crossing junctions in mixed traffic conditions of Indian scenario. The main objective of study is to analyze the pedestrian road crossing behavior at uncontrolled junctions. Adopting multiple regression technique the various parameters which effect the behavior of pedestrian. Vehicular gap, driver yielding behavior, frequency of attempts to cross, age and condition of pedestrian, rolling gap are some of the parameters that decide the pedestrian crossing time and other requirements. The surveys have been conducted at all junctions between Bowenpally to Kompally on national highway manually and analysis is made. The survey and statistical analysis concluded that at almost all junctions, the vehicular gaps and pedestrians behavior is not up to mark and the parameters considered indicate there is scope of accidents if suitable measures are not taken. It is concluded that counselling pedestrians and drivers for change of their behavior is very important. Providing visible marks for pedestrian crossing is to be done at all junctions. Traffic control devices are to be installed where ever possible. Considering the volume of pedestrian traffic all along the city, safe crossings for pedestrians has to be given.

Key words: Pedestrian Crossing-speed, Gap-acceptance, Delay, Safety, Mid-block crossing

I. INTRODUCTION

A person walking on road is called pedestrian. They are required to cross the roads to go to other side. Foot paths and crossing facilities like Zebra crossings, foot over bridges are to be provided for them, to safe guard their lives and make them move safely without any fear, or hurdle to their destinations. It is responsibility of the Government and authorities to ensure their safety. On their behalf, the drivers

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Comparative Study Of Partial Replacment Of Cement With Ceramic Powder For M30 Concrete

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Abstract: The cost of construction material is rising mainly due to high demand of concrete and scarcity of raw material affecting the economy of the structure. With increasing demand and consumption of cement, researchers and civil engineers are in search of developing alternate binders that are eco-friendly and contribute towards waste management. In such case, the use of industrial and agricultural waste produced by industrial processes has been the focus of waste reduction research for economic and environmental. In ceramic industry, about 15%-30% production goes as waste. These wastes create a problem in present-day society, requiring a suitable form of management in order to achieve sustainable development. The use of the waste materials in cement, concrete and other construction materials has numerous indirect benefits such as reducing the cost of concrete manufacturing, protecting environment from possible pollution effect. It may also result in foreign exchange earnings. In this study, the properties of concrete enhanced with partially replacement of Ceramic powder in the ratio of 0%, 5%, 10% and 15% by weight of cement in concrete were studied for M 30 grade. The properties, for fresh concrete are tested like slump cone test and for hardened concrete compressive strength and split-tensile strength at the age of 7, 28 and 56 days curing period and durability properties are also considered. The aim behind the use of Ceramic Powder as partial replacement in the concrete is to reduce the cost of material and as an eco-friendly structure.

Keywords: cement, M 30 grade, waste reduction

Introduction:

In ancient period, the structures are made from naturally occurring gaps formed between mountains and hills generally known as caves. As the time passes, with increasing population the number of caves occupied is increased. So as to protect the nature, construction of structures has been started. Initially buildings are constructed with the available local materials such as the stones, mud and lime. Later, as the technology improved stones were used in the foundation and the superstructure was constructed with the bricks made of lime and concrete

Ceramics:

Ceramics are special materials with many applications in almost all the engineering disciplines. But their importance has often been underestimated due to the fact that many people believe that ceramics are all about pottery and tiles. Today's ceramics industry is one of most rapidly advancing concerns in many parts of the world. Ceramic industry began to expand as a modern industry with the attribution of new techniques and knowledge gained in the 1970s. Since then it has also been one of most competitive industries in the market.

Uses of Ceramic Powder

Ceramic powder improves durability against freeze-thaw action due to possibility of much better controlled porosity. Ceramic powder also improves durability against chemical (chloride, sulphate) attacks. It has high elastic stiffness, compressive strength, split-tensile strength and modulus of rupture. Ceramic powder has highdimensional stability in certain glass ceramics, resulting in reduction in thermal cracking related to temperature cycling. Ceramic powder also possesses higher temperature resistance, which may be useful to prevent heat balls, such as due to hot jet exhaust on airfields pavements from vertical take-off / landingaircrafts.

Aim of the Study:

The present study deals with the partial replacement of ceramic powder for M 30 grade of concrete.

The aims of the study are:

- To understand the utilization of Ceramic powder and its effect in concrete.

DOI: 10.5373/JARDCS/V12SP2/SP20201062

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Article History: Received: Nov 08, 2019, Accepted: Jan 28, 2020

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Stabilization of Structures in Seismic Areas Subjected to Different Ground Motions

RAMACHANDER DAMERA , DR.ILANGO THANIARAS

Abstract: Structures with seismic damage with various ground motions are playing a vital role in some areas of research due to the increase in metropolitan culture which is getting developed in the world. In our present paper we are enhancing and focusing on the structural damage with some structural damages that are occurring due to earthquakes which can develop with ground motion intensity, structural performance and optimal intensity which can be used for best conclusions. The research is needed for civilization which can overcome the conditions of seismic affecting risks in seismic zones of Indian Context. An investigation like the methods of structural stability after an earthquake in developing the earthquake monitoring system vibration control ability of the structures is focused in this paper.

Index terms : Seismic analysis, analysis of structure.

I.INTRODUCTION:

The Seismic waves are described as the waves of energy which can travel through the layer of earth and also result in tremor, blast, or a fountain of liquid magma that bestows low-recurrence acoustic vitality. The waves with proliferation speed rely upon thickness and medium with versatility. The refraction or impression in geophysics for seismic waves is utilized for examination concerning Earth's inner structure, and man-made vibrations which can consistently create the shallow research and subsurface structures.

Revised Manuscript Received on December 22, 2018.

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With some upgrading parameters the seismic plan of structures has been made in light of spring like heading which are concentrated with earth shake powers with the distinction in structures which can avoid resonance. Due to the disconnection effect of shake powers with the sliding forces which can get transmitted with some structure with some pounding. [1] Due to the ground effects that are molded at the development length with can demonstrate an apex housetop with buoy and zenith that can be surveyed. As per the data which can be loaded down with basic term and the gathered with the imperativeness of stimulate grams that are made edge expanding speed limits. [2] An investigation has been done in different methods, for instance, seismic coefficient methodology and response go procedure with non straight static system. Due to these descriptive conditions the inclination ground story which can section the structure that passes on more burden diverged from the long length portion. Growing the plot for settled height the fragment forces and solidness of the structure reduces with augmentation in the point however for settled width structures it was extending. [3, 4] Analysis is led furthermore, has found the assortments for various hurt parts which can cause strong seismic tremor having little effect reliant on the last fold with technique for structure under free vibrations. Due to this we can redesign the mistake of the sections which can be mistreated with different ground developments which are same in all stages. The direct symphonious period with some ground development can be around reenact with dissatisfaction earth shiver. [5]

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INTEGRATION OF MATERIALS USED IN ANCIENT STRUCTURES FOR PRESENT DAY CONSTRUCTION

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Abstract:

Materials used in ancient era for construction has been focused here to understand the advantages of heritage buildings life time comparison with present construction practices. Brick and mortar based constructions of ancient structures with quality assessment comparison of present day work need to be studied, as a part of it the present paper focuses on the advantages and draw backs of both present and past constructional materials. Earth based mortars were used in all over the world since ancient times in extensive range of building types. Plastering is one of the most common current applications in earth based mortars for contemporary architecture. Mortars characterization confirmed that clay mineralogy drives important plaster properties like vapour adsorption, drying shrinkage and also have significance in mechanical resistance, dry abrasion and thermal conductivity. Present work discusses on the brick based mortar addition to increase strengthening properties of walls in comparison with present methods. Lime mortars significance is also studied as a part of novel approaches with stone and mortar addition comparatives.

1. Introduction

India has a very rich historic background which is evident from various buildings, forts, temples, landscapes, objects of historic era. Many of these were constructed several hundred years ago when the Indian Civilization was at its peak. Their architecture, design and construction at the time when computers, code of practice, design guidelines, research institutions and modern construction techniques did not exist makes one to realize the wisdom and expertise of our forefathers. As on present scenarios of mortar applications study between present and past, considerable factors to follow are:

- ✦ Characterization of different period masonry materials, through maps of not homogeneous areas, i.e. areas with different type of bricks or stone blocks;
- ✦ Discovery of hidden structural elements, such as arches, columns, choirs included in the existing masonry;
- ✦ The description of the original construction techniques and typologies;
- ✦ Evaluation of structural performances through determination of damage in fractured masonries;
- ✦ The detection and classification of surface damage;
- ✦ Examination of structural vulnerability through investigation of physical/mechanical properties of mortars, stones and bricks;
- ✦ Inspection of previous refurbishment and/or maintenance techniques (injections, stitching armed joints) [1].

1.1 Aim of the study

Now the question is whether these techniques and methods are easily usable and adoptable in today's era and upcoming futuristic demand. Hence we have studied the relevance of such techniques and materials with respect to availability of material and skilled labour also the speed and cost of the development, also the main factor which is usually not considered is environmental impact. And we can definitely say that using these techniques has far more additional benefits & solution to our everyday rising problems [2].

To define a reliable interdisciplinary procedure for brick masonry identification in complex historic buildings, in order to enhance documentation, conservation and restoration issues, thereby putting into value the architectural heritage. The methodology integrates experimental data obtained through on

A Study on Impact of Working Capital Management on Profitability: A New Dimension from Indian Top Five Cement Companies' Perspective

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Abstract

Management of working capital is considered as a "three faces' coin" with each of inventory management, debtors (debtors + receivables) management along with credit suppliers and short-term lenders management. Still there exists a big tragedy between allocation of permanent (fixed) capital and circulating (working) capital. Even from the inception to incredible operations, firms are undergoing the mismatching status of working capital with respect to operational requirements. The present study encompasses the practical guide of WCM to the small cement producing firms in India, as this study has narrated the working capital policy management of largest cement companies in India. The results revealed that, in order to be considered as biggest companies in the Cement world, the selected firms need to strengthen their working capital position to reap more profits. From the analysis, it is clear that there exist a positive relation exist between profitability and components of WCM.

Keywords: return on capital employed (ROCE), current ratio, inventory holding period (IHP), debt collection period (DCP), debt payment period (DPP), and net working capital

1. Introduction –

1.1 Cement Industry [1]India is the silver medalist in production of cement on the globe. Indian cement industry is catering as one of the major industry to the economy and generating employment to more than 10,00,000 people. Since its deregulation, it has attracted a huge amount of FDI from multinational investors. India has a wider scope for its development especially in infrastructure building with the assistance of cement industry. Recent growth prospects like making 98 selected smart cities will push the cement industry in an upward direction. wcm ## working capital management

1.2 Introduction – Working Capital

It is a contest between the fixed capital and working capital allocation. In general lose-lose situations mostly observed repetitively in many of the firms irrespective of the industry nature and size with failure of predicting future conditions of the firm.

Allocation of excessive working capital or conservative working capital leads to collapse of reaching objectives. Hence it is very important to become considered as a financial manager, the optimum allocations by predicting future requirements of the firm along with conditions internally and externally.

"ANALYSIS AND OPTIMIZATION OF ENGINE CYLINDER HEAT TRANSFER THROUGH FINS OF VARYING GEOMETRY AND MATERIAL"

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Abstract The Engine cylinder is one of the major automobile components, which is subjected to high temperature variation and thermal stresses. In order to cool the cylinder, fins are provided on the cylinder to increase the rate of heat transfer. In doing thermal analysis on the engine cylinder fins, it is helpful to know the heat dissipation inside the cylinder. The principle implemented in this project is to increase the heat dissipation rate by using the invisible working fluid, air. We know that, by increasing the surface area we can increase the heat dissipation rate. So designing such a large complex engine is very difficult. The main purpose of using these cooling fins is to cool the engine cylinder by air. The main aim of the project is to analyze the thermal properties by varying geometry, material and thickness of cylinder fins. Parametric models of cylinder with fins have been developed to predict the transient thermal behavior. The models are created by varying the geometry, rectangular, circular and curved shaped fins and also by varying thickness of the fins. The 3D modeling software used is Pro/Engineer. Thermal analysis is done on the cylinder fins to determine variation temperature distribution over time. The analysis is done using ANSYS. Transient thermal analysis determine temperatures and other thermal quantities that vary over time. The variation of temperature distribution over time is of interest in many applications such as with cooling. The accurate thermal simulation could permit critical design parameters to be identified for improved life. Presently Material used for manufacturing cylinder fin body is Aluminum Alloy 204 which has thermal conductivity of 110-150W/mk. We are analyzing the cylinder fin using this material and also using Aluminum alloy 6061 and Magnesium alloy which have higher thermal conductivities.

Key words: Geometry, Fins, Material, Heat transfer, Effectiveness, Pro-E, ANSYS.

1. INTRODUCTION

Internal Combustion Engine The internal combustion engine is an engine in which the combustion of a fuel (normally fossil fuel) occurs with an oxidizer (usually air) in a combustion chamber. In an internal combustion engine, the expansion of the high-temperature and -pressure gases produced by combustion applies direct force to some component of the engine, such as pistons, turbine blades, or a nozzle. This force moves the component over a distance, generating useful mechanical energy.

1.1 NECESSITY OF COOLING SYSTEM IN IC ENGINES All the heat produced by the combustion of fuel in the engine cylinders is not converted into useful power at the crankshaft. A typical distribution for the fuel energy is given below: Useful work at the crank shaft is 25%, Loss to the cylinders walls 30%, Loss in exhaust gases 35%, Loss in friction 10%.

1.2 LITERATURE SURVEY Heat engines generate mechanical power by extracting energy from heat flows, much as a water wheel extracts mechanical power from a flow of mass falling through a distance. Engines are inefficient, so more heat energy enters the engine than comes out as mechanical power; the difference is waste heat which must be removed. Internal combustion engines remove waste heat through cool intake air, hot exhaust gases, and explicit engine cooling. Cooling is also needed because high temperatures damage engine materials and lubricants. Internal-combustion engines burn fuel hotter than the melting temperature of engine materials, and hot enough to set fire to lubricants. Engine cooling removes energy fast enough to keep temperatures low. Most internal combustion engines are fluid cooled using either air (a gaseous fluid) or liquid coolant run through a heat exchanger (radiator) cooled by air. Marine engines and some stationary engines have ready access to a large volume of water at a suitable temperature. The water may be used directly to cool the engine, but often has sediment, which can clog coolant passages, or chemicals, such as salt, that can chemically damage the engine. Thus, engine coolant may be run through a heat exchanger that is cooled by the body of water, most of liquid-cooled engines use a mixture of water and chemicals such as antifreeze and rust inhibitors. The industry term for the antifreeze mixture is *engine coolant*. Some antifreezes use no water at all, instead using a liquid with different properties, such as propylene glycol or a combination of propylene glycol and ethylene glycol. Most "air-cooled" engines use some liquid oil cooling, to maintain acceptable temperatures for both critical engine parts and the oil itself. Most "liquid-cooled" engines use some air cooling, with the intake

Experimental Analysis Of Plasma Spray Technique With Zirconium Oxide Mixture On Ss304 Material As Thermal Barrier Coating

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Abstract: Porosity is vital in most engineering applications in plasma-spray coatings. Porosity has its strengths and demerits based on coating functionality and immediate working conditions. A thorough analysis of pore as is carried out in this work on plasma sprayed coatings. The formation and growth of porosity on plasma sprayed coatings is controlled by defined parameters of spray. Optimized parameters for set spraying were employed to produce the desired coatings with minimal defects. Problems such as porosity are still present with advanced set spray parameters. Here, we are discussing other ability to measure porosity in plasma-spraying coatings with emphasis on atmospheric plasma sprays (mixed with titanium-oxide and carbide) of zirconium oxide. Microstructures with XRD as a part of non-destructive testing methods had been used to check the structural values with thermal impact. A L16 orthogonal array used for optimise the parameters with Taguchi optimal method by segregating parameters for better optimal results.

Key words: Plasma spray, TBC, Zirconium, Taguchi, SS304, SEM

1.0 Introduction

In advanced gas turbines thermal barrier coats (TBCs) are commonly used for shielding the metallic substratum from high temperature gas thermal dehydration [1, 2]. The use of TBCs will increase the efficiency and performance of turbines significantly. A standard TBC system consists of a container load, ceramic top-coat (TC), a metal bond-coat, and the heat oxide (TGO), the thermally developed oxide, forming between TC and BC. Temperature reductions in all TBC's are usually controlled by material and geometry, in particular thermal conductivity and thickness, of the TC layer in a specific work area. [3–9]. The thermal insulation potential of the coating's improvements with the increase in the TC thickness of a given ceramic material. The thermal mismatch stress of the coatings will nevertheless increase at the same time. The thermal insulation capabilities and the thermal stress level are well-recognized. Defining the required TC thickness for the hot components becomes a problem with optimization process.

2.0 LITERATURE REVIEW

The optimal TBC design will enhance the efficiency and performance of the coating with the thickness for gas turbine sheets. It is desirable for the layer design for engineering applications to be usable, easy and effective. Sadly, little work on this matter has been published. The substrate without TBC, for example the failure analysis of the blade [10–12], the simulation of heat transfer [13, 14], etc, or the

RESEARCH ARTICLE

Segmentation of tumor using PCA based modified fuzzy C means algorithms on MR brain images

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Abstract

In the field of medical sciences, automatic detection of tumor using magnetic resonance (MR) brain images is a major research area. The goal of the proposed work is to identify the tumors in MR images using segmentation methods and to locate the affected regions of the brain more accurately. Medical images have vast information but they are difficult to examine with lesser computational time. An innovative process is proposed to extract tumor cells using the discrete wavelet transform (DWT). After extracting features with DWT feature reduction is carried out with the principal component analysis (PCA). Modified fuzzy C means (MFCM) technique is used for segmenting the tumor cells. The efficiency of the proposed method to identify different abnormalities in real MR images for intracranial neoplasm detection, tuberculoma, and bilateral thalamic fungal granulomas identification is tested. The results obtained are shown in-terms of Accuracy, Dice Similarity Index (DSI), and Jaccard Index (JI) measures. The performance of the proposed method is tested in terms of performance measures like Accuracy, DSI, and JI. These results are compared with the conventional fuzzy C means (FCM) method.

KEYWORDS

brain tumor, DWT, feature extraction, fuzzy C means and MRI

1 | INTRODUCTION

The objective of the medical image processing techniques is to identify images or objects with tranquil visually. Medical images are used as an evidence for the physical attributes. MRI images are used to identify tumors in brain. The most significant aspect is segmenting the tumors to locate the actual position and regions of the abnormal tissues in MRI images. The tumors can have variability in shape, size, and can appear at any position in brain with diverse intensities. They are classified into two categories:

- Benign tumors are consistent compositions that do not enclose cancer cells. They are simple to monitor by

radiological apparatus. These tumors may eternally develop back again.

- Malignant tumors are inconsistent compositions and they comprise of cancer cells. They have to be treated by the combination of radiotherapy and chemotherapy. They are life frightening.

In this article, we have concentrated on three types of diseases:

1. *The intracranial neoplasm disease:* It is formed when abnormal cells mount up in the interior lobe of the brain, formally named as a tumor. These cells reproduce in an abandoned way and destruct the brain tissues.

Computational and experimental analysis of LiFePO_4/C cathode material for lithium ion battery applications

Cite as: AIP Conference Proceedings **2269**, 030047 (2020); <https://doi.org/10.1063/5.0019659>
Published Online: 12 October 2020

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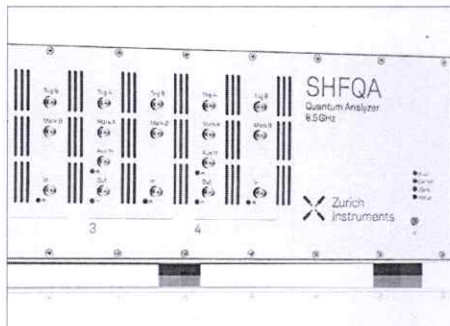
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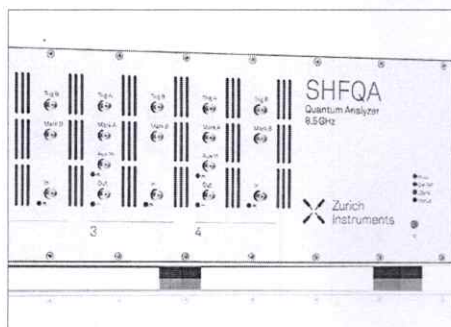
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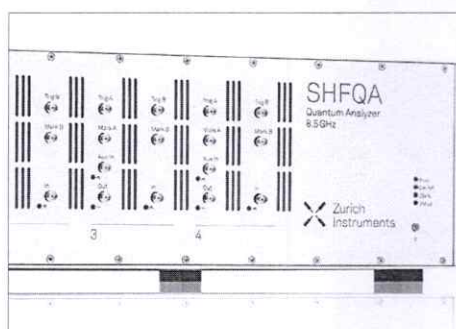
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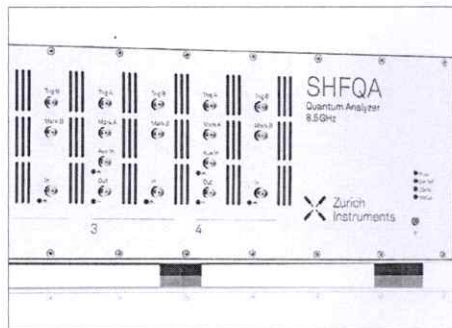
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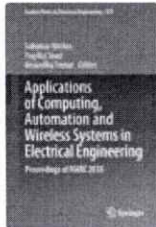


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Applications of Computing, Automation and Wireless Systems in Electrical Engineering pp 383–392

Krill Herd Algorithm for Solution of Economic Dispatch with Valve-Point Loading Effect

Harish Pulluri, N. Goutham Kumar, U. Mohan Rao, Preeti
✉ & Mekala Girish Kumar

Conference paper | First Online: 01 June 2019

925 Accesses | **1** Citations

Part of the Lecture Notes in Electrical Engineering book series (LNEE, volume 553)

Abstract

The article presents a novel bio-inspired Krill Herd (KH) algorithm to solve economic dispatch problems. KH algorithm is based on crowding behavior of the krill individuals and achieves a near global optimum solution by using three main actives. The proposed algorithm is tested by considering three and six generating unit systems on different loads on objective function. The attained results have proved that the KH algorithm provides remarkable results as compared with the


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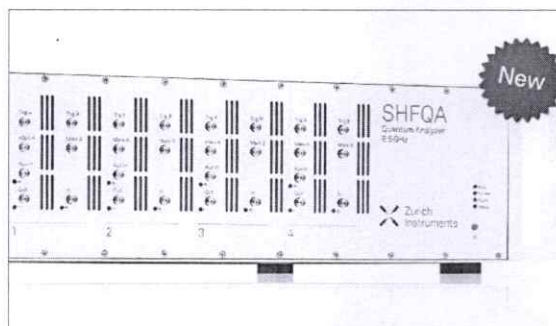
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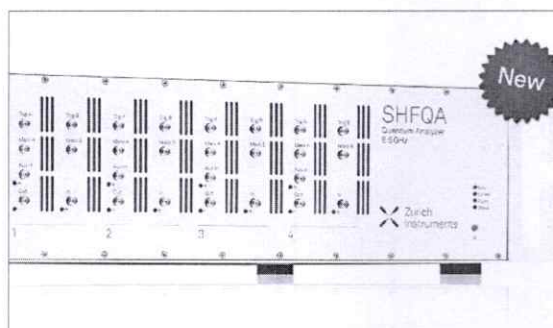
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Synthesis And Charecterization Of $\text{LiMn}_{1.5}\text{Ni}_{0.5}\text{O}_4$ By Sol-Gel Method For Cathode Material & It's Application In Li-Ion Battery

Subhashini Vedala^{1*}, M. Sushama², M. Aruna Bharathi³

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Abstract. Our past decade witness to the quick growth of Li-Ion battery industry in response to the growing needs of electronic and information industries. Lithium Cobalt Oxide used as Initial cathode material for Lithium batteries application it consist of high toxic nature, costly and with low energy density. Thus there need to develop new Li-Ion batteries to improve above characteristics along with efficiency and make it portable. So that can be used in electronics, transportation, and energy storage and especially in hybrid electric vehicles. $\text{LiMn}_{1.5}\text{Ni}_{0.5}\text{O}_4$ is hence the best development seen so far. It is improved version of LiCoO_2 . It usually overcomes all the problem of older lithium batteries. The high initial capacity and good cycling behavior of $\text{LiMn}_{1.5}\text{Ni}_{0.5}\text{O}_4$ powders calculated at higher temperatures are closely related with the higher crystallinity and retention of the spinel structure with cycling and hence proved that $\text{LiMn}_{1.5}\text{Ni}_{0.5}\text{O}_4$ is far better than other batteries. For synthesizing $\text{LiMn}_{2-x}\text{Ni}_x\text{O}_4$, we use sol-gel procedure. The electro chemical performances of prepared samples are tested. The crystallinity and lattice constants by X-Ray diffraction, thermal analysis by TGDTA, morphology by SEM and bonding between the atoms by FTIR were studied in this paper.

INTRODUCTION

In order to improve the efficiency energy density of LIBs, the cathode materials having either high reversible capacity or high operating voltage have been developed. Ni doped manganese spinel having operating voltage higher than ($>4.6\text{Vvs. Li/Li}^+$) that of conventional LiMn_2O_4 (4V) cathode material. The 4V manganese spinel suffers from structural degradation and John-Teller distortion, which is occurred due to Mn valance changes to Mn^{3+} in discharging period. This problem is overcome by the Ni doped Mn spinel $\text{LiMn}_{1.5}\text{Ni}_{0.5}\text{O}_4$ (LNMO), in which Mn valance relics 4^+ , because Ni ion are active with electron redox reaction ($\text{Ni}^{4+} \leftrightarrow \text{Ni}^{2+}$). So LNMO is free from Jahn- Teller distortion and disproportionation reaction. Hence LNMO provides outstanding structural stability with high working voltage ($>4.6\text{Vvs. Li/Li}^+$) beneficial with respect to energy density and cycle life as a cathode for LIBs.

Partial replacement of Mn in LiMn_2O_4 with Ni is effective approach to improve the electrochemical properties of LiMn_2O_4 because the bonding energy of Ni-O is stronger than Mn-O. The stronger Ni-O bond is in favor of maintaining the spinel structure during cycling. This prevents the structural disintegration of materials. In case of Ni doping, the ionic radius of 0.64\AA , which is nearly the same as that of Mn^{4+} (0.54\AA), so Ni can substitute for Mn in $\text{LiMn}_{1.5}\text{Ni}_{0.5}\text{O}_4$. The strong Ni-O bond is beneficial to improve electrochemical properties of LiMn_2O_4 . Cation doping (like Ni) can improve conductivity, enlarge lattice constants and form stronger M-O bond, etc., which are favorable for the migration of lithium ions and maintaining stable crystal structure. Better electrochemical properties can be expected by choosing appropriate elements and amount. The advantage of $\text{LiMn}_{1.5}\text{Ni}_{0.5}\text{O}_4$ has better structural stability superior to the un-doped manganese spinel (LiMn_2O_4).



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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/10439

DOI URL: <http://dx.doi.org/10.21474/IJAR01/10439>



RESEARCH ARTICLE

AN ANALYTICAL STUDY ON NPAS OF STATE BANK OF INDIA

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Manuscript Info

Manuscript History

Received: 01 December 2019

Final Accepted: 03 January 2020

Published: February 2020

Key words:-

Non-Performing Assets, State Bank of India (SBI), Merger, RBI Resolutions

Abstract

Objectives: The main objective of this paper is to make an attempt to analytically study the basic reasons for increase in NPAs/analyze gross NPAs in SBI group and the measures taken so far and their impact.

Method: Data is collected for the Variables namely Net Profit Margin, Return on Equity and Return on Assets, Gross NPAs to Gross Advances, Net NPAs to Net Advances, Cost to Income and Provision Coverage Ratio. Secondary data is collected for a period of 5 years i: e from 2014-15 financial year to 2018-2019 Financial Year. Statistical tool like percentage analysis is used to identify the reasons for increase in NPA's of State Bank of India.

Result: It was found in the study that, the major sectors contributed for the increase in NPAs in SBI are mid and Large corporates and not the priority sector. NPAs are increasing from the last five years as shown in the ratios calculated. This is due to change in the method of projecting NPAs and stringent norms by RBI.

Conclusion: The present paper analyzed and identified the reasons for increasing trend of NPAs in SBI group. SBI is in hope that it could see the development in coming years as they are expecting the resolutions for pending cases from the National Company Law Tribunal (NCLT).

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Introduction: -

Public banks in India had been facing the problem of stressed assets over the period of time in spite of many resolutions. Recently, Reserve Bank of India came with revised framework for the functioning of banks with respect to stressed assets. RBI has made some stringent norms for the treatment of bad loans. Now it is also planning to ease certain norms (for small and medium enterprises) without diluting the spirit with which it has initiated resolutions. SARFAESI - Securitisation, Reconstruction and Financial Assets and Enforcement of Security Interest Act 2002² was a significant step in the reforms in financial sector in India.

As per the reports of Standard and Poor, April 2018, India is in 55th place among the top 100 largest banks in the world in terms of total assets held.

Union cabinet in India has approved the merger of State Bank of India (SBI) with five of its associates in 2017 with an aim to reduce the cost to income ratio, to help Indian economy to rank higher in the global banking rate, to rationalize more resources etc.

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Enhanced microwave absorption properties of Ni_{0.48}Cu_{0.12}Zn_{0.4}Fe₂O₄ + polyaniline nanocomposites

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ARTICLE INFO

Keywords:

Nanocomposites
Permittivity
Permeability
Microwave absorption
Reflection loss

ABSTRACT

Nanocomposites of (1-x) Ni_{0.48}Cu_{0.12}Zn_{0.4}Fe₂O₄ (NCZ) + x Polyaniline (PANI), (x = 0, 0.1, 0.2, 0.3, 0.4, 0.5, 1) with varying composition were successfully prepared from nanopowders of Ni_{0.48}Cu_{0.12}Zn_{0.4}Fe₂O₄ synthesized by microwave hydrothermal method. The samples were characterized using X-ray diffraction (XRD), scanning electron microscopy (SEM) and Fourier Transform Infrared spectroscopy (FTIR). The characterization studies revealed the confirmation of spinel and polymer phases in the composite samples. The dielectric, magnetic and electromagnetic properties were studied over frequency range of 8.2–12.4 GHz (X-band) and 12.4–18 GHz (Ku-band). It was found that the addition of PANI filler in ferrite matrix enhances the microwave absorbing properties with the increment of dielectric and magnetic losses. The nanocomposite sample with 50 wt% PANI was found to exhibit minimum reflection loss of -42.10 dB near 9.35 GHz with the effective bandwidth of 3.8 GHz and -39.34 dB near 14.05 GHz with effective bandwidth of 2.8 GHz. The current results indicate that the present materials can be selected to design microwave absorbing filters both in X-band and Ku-band frequency regions for electromagnetic interference applications.

1. Introduction

In recent years there is an increase in demand for the development of absorbing materials in microwave frequencies region to suppress the effects of electromagnetic interference (EMI). Due to the fast development of advanced technology in several fields such as electronic wireless communications, military, commercial and medical applications, there has been widespread use of microwave devices in GHz frequency range [1–3]. These devices are capable of producing electromagnetic interference which can cause severe interruptions on functioning of several electronically controlled devices resulting in decrease in performance. Moreover, over exposure to microwave energy may lead to potential health hazards to the human body [4,5]. Hence, while using high frequency electronic devices EMI becomes a matter of serious concern. In order to control these problems created by electromagnetic interference the devices have to be shielded by the materials which can suppress the unwanted electromagnetic radiation and reduce the noise level of signals. Traditionally, conducting materials can shield the devices by reflecting the electromagnetic radiation. However, in the case of conducting shields the main drawbacks are heaviness, lack of flexibility,

high cost of processing, etc. Electromagnetic shielding through absorption instead, offers an effective means to solve these problems. Hence, shielding materials capable of absorbing unwanted electromagnetic waves were investigated by many researchers [6–11]. In order to acquire excellent microwave absorbing properties, the shielding materials should possess mainly two important characteristics, viz., the wave attenuation through the material layer, called attenuation characteristic and the impedance matching, the impedance of the material medium should match the impedance of free space. In addition to these, the other parameters such as light weight, thickness, mechanical strength, miniaturization, wider absorption bandwidth, environmental resistance, should be taken care of while producing and designing the microwave absorbing materials [12]. Over the past decades ferrite absorbers have been developed to study the microwave absorbing properties and found that they exhibit excellent magnetic and dielectric properties though they are heavy and expensive [13]. Polymers were designed to be used for microwave shields due to lightweight, flexibility and cost effectiveness. However, polymers are insulating materials and are transparent to electromagnetic waves. In order to suppress electromagnetic waves effectively by the materials with enhanced microwave absorbing

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<https://doi.org/10.1016/j.jpcs.2021.110048>

Received 8 October 2020; Received in revised form 25 December 2020; Accepted 7 March 2021

Available online 15 March 2021

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19-20-17



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Dielectric relaxation and thermodynamic study of Dimethylformamide/1,4-Butanediol binary mixtures in the temperature range 298K–323K

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ARTICLE INFO

Keywords:

Dipole moment
Dielectric relaxation
Excess parameters
Effective Kirkwood correlation factor (g^{eff})
Helmholtz energy
Mixing rules

ABSTRACT

In the present paper, the permittivity of Dimethylformamide (DMF) with 1,4-Butanediol (BD) binary mixtures are determined at the temperature range of 298 K–323 K in the microwave frequency. Dipole moment (μ), excess molar volume (V_m^E), partial molar volume ($V_{m,i}$), excess permittivity (ϵ^E), excess refractive index (n_D^E), excess inverse relaxation time ($1/\tau$), thermal expansion coefficient (α_p), excess Helmholtz energy (ΔF^E) are determined at different temperatures. Redlich-Kister polynomial equation is used to fit the excess parameters. Havriliak-Negami equation is used to analyse the relaxation time of the binary mixtures throughout the measured temperature range. The heteromolecular interaction between DMF and 1,4-Butanediol binary mixtures are interpreted in terms of Kirkwood correlation (g^{eff}) factor. The stability of the system is analysed from the activation energy (ΔG^*), enthalpy (ΔH^*) and entropy (ΔS^*) parameters. The various mixing rules were applied in order to estimate the permittivity and refractive indices of the binary system at different temperatures.

1. Introduction

The complex permittivity of binary liquid mixtures provides information regarding the solute-solvent interactions and also the existence of monomers and multimers in the solution. The permittivity is a macroscopic parameter plays a significant role in understanding the nature of molecular interaction between polar-polar, polar in a non-polar liquid medium and also the alignment of dipoles in the solution [1–10]. The profound knowledge in thermodynamics and transport properties of pure liquids and their binary mixtures is essential to solving many chemical engineering problems, heat and mass transfer, and drug design calculations. The temperature dependent dielectric relaxation studies of different polar liquids at different microwave frequency region can yield the information regarding the structure of the molecule, inter and intra molecular hydrogen bonding and orientational polarization of the dipoles [11–23]. Investigation of permittivity of polar liquids having the hydrogen bond donor and acceptor group compounds are very much useful for various number of applications in the field of biological, medical, material science and technology [24,25].

Dimethylformamide (DMF) is a polar (hydrophilic) aprotic solvent with a high boiling point. DMF is used as a solvent in peptide coupling for pharmaceuticals, pesticides production, manufacture of adhesives,

synthetic leathers, fibre films and surface coatings. Whereas 1,4-Butanediol (BD) is used in the manufacturing of plastics, fibres, and as solvent for many chemical reactions. Several researchers and scientists reported the dielectric relaxation of DMF in the different solvent medium such as toluene, benzene, benzoates, 3-Nitrotoulene in the recent past [26–37]. Stockhausen et al. [38] studied the dielectric relaxation of BD + DMF binary mixtures in the range of 5 MHz–72 GHz at 20 °C. The relaxation times of the binary mixtures are interpreted in terms of empirical equation by considering viscosity terms and the rotation of carbon chain group. Navarkhele et al. [39] also studied the dielectric relaxation behaviour of BD + DMF binary mixtures in the frequency range 10 MHz–20 GHz between the temperatures 20°C–40 °C. The relaxation time of these mixtures is calculated from the Cole-Cole plot and the molecular interaction are discussed in terms of excess permittivity and Kirkwood g factor [40]. The physico-chemico properties of the binary mixtures of DMF with alkanols and their interactions are interpreted by considering the molar volume and refraction values [41]. Whereas in the present study we have considered volumetric and thermal expansion (α_p) parameters [42,43], electrical dipole moment, molar polarization [23], long-range and short-range interactions between the dipoles by excess Helmholtz energy (ΔF^E) equation [44], thermodynamic quantities [45] to interpret the molecular interaction between 1,4- Butanediol

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Received 24 November 2019; Received in revised form 23 January 2020; Accepted 9 March 2020

Available online 27 March 2020

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19-20-18

Attenuation Effect in Twenty One Different Proton Dissociation Equilibriums Brought on One Rope: A Chemical Education Tool for Evaluation of pK_a of Proton Dissociation Equilibrium of Any Substituted Benzene (XC_6H_5)

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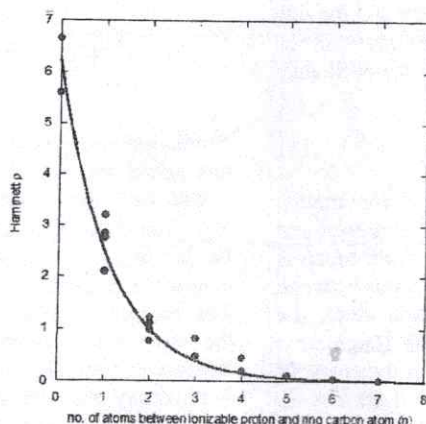
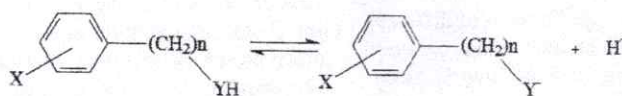
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Received January 07, 2020; Revised February 16, 2020; Accepted March 07, 2020

Abstract The strong empirical relation, $\rho = (2.4)^{(2-i)}$, between the Hammett ρ for proton dissociation of several acids and the number, "i", of atoms between the ionizable hydrogen and the ring carbon (Andrew Williams, Free Energy Relationships in Organic and Bioorganic Chemistry, Royal Society of Chemistry, Cambridge, 2003, p. 75) is used to construct a graph for twenty one different proton dissociation equilibriums. The plot of Hammett ρ versus number of atoms i between ionizable hydrogen and the ring carbon atom is observed to be an excellent exponential-decay locus. A good average and intelligent value of Hammett ρ is obtained for the benzene dissociation equilibriums by interpolating the locus of the correlation on to Y-axis. Using this Hammett ρ value and the Hammett equation $\log [(K_a)_X / (K_a)_H] = \rho\sigma$, the pK_a value can be calculated for any substituted benzene knowing the pK_a value of benzene to be 4.3. The points for proton dissociation equilibriums of phenylethyl ammonium ions and benzyl alcohols deviated from the graph hence not included in the correlation. Possible explanations are given for deviation of these two equilibriums.

Graphical abstract

The term "attenuation" in general implies that it is the exponential depletion of some property either physical or chemical with time, distance and medium. Attenuation is an exponential property with the length of the medium. Of particular interest, it is the diminution of substituent electronic effects in a molecule during the course of any chemical change.



Influence of Slip and Heat and Mass Transfer Effects on Peristaltic motion of Power-law fluid Prone to the Tube

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Abstract. Present study deals with the study of peristaltic motion of a power-law fluid with nanoparticles in a tube with permeable walls. Heat and mass transfer effects and slip effect are studied in this investigation. Axial velocity, pressure gradient and frictional force are expressed analytically and investigated various parameter effects on these flow variables. The present model revealed that, heat transfer coefficient and mass transfer coefficients increases in the region $[-1, 0]$ and decreases in the region $[0, 1]$ with the increase of thermophoresis parameter and shows an opposite behavior with the increase of Brownian motion parameter. Pressure drop increases with the increase of slip parameter. Frictional force decreases with the increase of slip parameter and converges to 1.

1. Introduction

Peristalsis is very important phenomena in the human body. This phenomenon has many biological and industrial applications. Many researchers have done investigations in the peristaltic transport. (Brasseur et al. (1987), Valanis and Sun (1969), Mishra and Ramachandra Rao (2003), K. M. Prasad (2009), Hayat et al. (2014), Chandra and Pandey (2018)).

“Power-law fluid is a fluid in which the shear stress at any point is proportional to the shear rate at that point raised to some power”. The problems based on non-Newtonian fluids have many applications and hence good number of researchers started working in this area. Ostwald-de Waele model is widely used model for non-Newtonian fluids focusing on power-law rheology. Power-law fluids are classified into three different types of fluids as given below:

n	Type of Fluid
<1	Shear-Thinning Fluids
=1	Newtonian Fluid
>1	Shear-Thickening Fluids

Many researchers done their research in this field (El Naby and El Shamy (2007), Hayat et al. (2006), Shukla and Gupta (1982)).

Nanofluids have many biomedical and industrial applications. New techniques are used using nanofluids for cancer treatments and for safer surgery for the delivery of drugs. A good amount of



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19-20-②

Fourth order computational method for two parameters singularly perturbed boundary value problem using non-polynomial cubic spline

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Abstract: In this paper, we proposed a fourth order finite difference scheme using non-polynomial cubic spline for the solution of two parameters singularly perturbed two-point boundary value problem having dual boundary layer on a uniform mesh. In this method, the first order derivatives in the non-polynomial cubic spline finite difference scheme are replaced by the higher order finite differences to get the discretisation equation for the problem. The discretisation equation is solved by the tridiagonal solver discrete invariant imbedding. The proposed method is analysed for convergence and a fourth order rate of convergence is proved. The numerical results are compared with exact solutions and the outcomes of other existing numerical methods.

Keywords: two parameters; singularly perturbed; two point boundary value problem; dual boundary layer; characteristic equation; non-polynomial cubic spline.

Reference to this paper should be made as follows: Phaneendra, K. and Mahesh, G. (2019) 'Fourth order computational method for two parameters singularly perturbed boundary value problem using non-polynomial cubic spline', *Int. J. Computing Science and Mathematics*, Vol. 10, No. 3, pp.261-275.

Biographical notes: K. Phaneendra is working as an Assistant Professor at the Department of Mathematics, University College of Science, Saifabad, Osmania University, Hyderabad, India. He did his PhD from N.I.T. Warangal in the area of numerical methods for singular perturbation problems. His area of research is numerical solution for a class of singularly perturbed which includes differential difference equations, singular boundary value problems and multi parameter problems. He published 36 research articles in various international journals.

G. Mahesh is Research Scholar in the Department of Mathematics, University College of Science, Saifabad, Osmania University, Hyderabad, India. His area of research is numerical solution to two parameter singularly perturbed boundary value problems. He published two research articles in reputed journals.


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19-20-3



Review article

Can Non-bonded Pair of Electrons of sp^3 Nitrogen with Two Single σ -Bonds on Either Side Still Transmit Substituent Electronic Effects to the Reaction Site? Reversal of Attenuation Effect by sp^3 Nitrogen-A Chemical Education Perspective



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ARTICLE INFORMATION

Received: 22 February 2019
Received in revised: 26 March 2019
Accepted: 30 June 2019
Available online: 18 August 2019
DOI: [10.33945/SAMI/CHEMM.2020.1.10](https://doi.org/10.33945/SAMI/CHEMM.2020.1.10)

KEYWORDS

Taft equation
Attenuation effect
 sp^3 nitrogen
Carbamic acids

ABSTRACT

Dependence of reactivity of organic molecules on substituents was a well-established phenomenon in terms of Hammett and Taft equations in physical-organic chemistry. The well-known Hammett and Taft linear free energy relationships were extensively used in elucidating the organic reaction mechanisms. The exponential depletion of Hammett reaction constant (ρ), as a function of distance in terms of increasing the number of sp^3 carbon atoms ($-CH_2-$) between the reaction center and the substituent, is understood from our laboratory experiments. But, introduction of sp^2 carbon atoms ($-CH=CH-$) between the reaction center and the substituent enhances the Hammett reaction constant (ρ). In the present work, we have tried and observed the same and even little more effective transmission of substituent effect through sp^3 nitrogen ($-NH-$). However, the presence of a sp^3 carbon by the side of sp^3 nitrogen ($-NH-CH_2-$) depletes the substituent effect in the usual manner in *N*-phenyl glycines. Probable explanations were presented in support of our observation. In the present work, the observations were manifested in terms of Taft ρ^* values instead of Hammett ρ value as the pK_a values of only 4-nitrophenylcarbamic acid and carbamic acids and the Taft σ^* values of 4-nitrophenyl and H are available from literature.

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19-20-(4)

Preparation and characterization of red emitting Yttrium Vanadate phosphor doped with Eu(III): $Y_{1-x}VO_4: Eu_x$

Cite as: AIP Conference Proceedings 2162, 020117 (2019); <https://doi.org/10.1063/1.5130327>
Published Online: 29 October 2019

G. Neeraja Rani, J. Shankar, J. Anjaiah, B. Mamatha, and N. H. Ayachit



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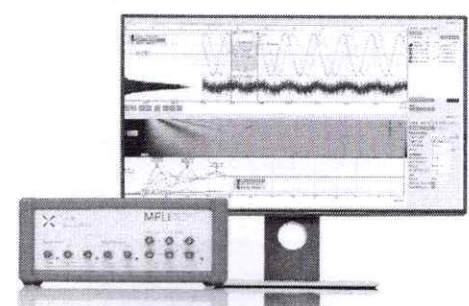
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19-20-6

Shielding Effectiveness studies of NiCuZn ferrite-Polyaniline nanocomposites for EMI suppression applications

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Abstract. Electromagnetic interference shielding effectiveness (EMI SE) of multifunctional NiCuZnFe₂O₄-Polyaniline are studied. The nanocrystalline NCZ-PANI nanocomposites were prepared by the mechanical milling process. The structure and the morphology of the nanocomposites were investigated by Fourier Infrared spectroscopy (FTIR) and scanning electron microscopy (SEM). Electromagnetic properties and EMI SE behaviors were performed over a frequency range of 8.2-12.4 GHz (X-band) and 12.4-18 GHz (Ku-band). The results show that for nanocomposites, the values of the real (ϵ') and imaginary permittivity (ϵ'') and imaginary permeability (μ'') increase, while the value of real permeability (μ') decreases as the filler content (PANI) increases. The contributing effects of PANI content on total shielding efficiency (SE_{total}) of different samples were investigated. The maximum EMI SE of 29 dB is obtained for a composite of 50 wt.% PANI with the dominant shielding by absorption (SE_A) of electromagnetic radiation. The enhanced electromagnetic shielding performance of nanocomposites is attributed to the increment of both magnetic and dielectric losses due to the incorporation of conducting PANI in magnetic NCZ matrix. Synthesis parameters such as the amount and particle size of PANI and NCZ affect significantly the morphology, the conductivity, and the microwave absorption properties of the final materials. The possibility to modulate the electromagnetic properties of the composite materials is of great interest to fabricate microwave absorbing and electromagnetic shielding materials with high performances.

INTRODUCTION

To reduce the impact of electromagnetic interference (EMI), EMI shielding materials have been widely investigated. Normally, metals have been used for EMI shielding materials as they have high conductivity and dielectric permittivity. [1, 2] However, metals have disadvantages, such as their corrosion, weight properties, and poor processability.[3] Ferrite-polymer nanocomposites have been used extensively in the shielding of electromagnetic noise due to their excellent electromagnetic properties.[4-6] The polymer and ferrite composites can be used as EMI suppressor materials to avoid the disadvantages seen in metals.[7,8] The complex permittivity and permeability are closely related to the high-frequency dielectric and magnetic properties of magnetic particles and volume fraction of the fillers in the composites. Ferrites are used as magnetic fillers in the composites due to the high magnetic loss, high chemical stability, and high resistivity, etc. The high-frequency dielectric and magnetic properties can be tuned by varying the ferrite concentration in the ferrite-polymer composites.

In the present investigation, various Polyaniline (PANI) loaded Ni_{0.48}Cu_{0.12}Zn_{0.4}Fe₂O₄ (NCZ) matrix nanocomposites were prepared at room temperature. The NCZ can be used in microwave devices and electromagnetic suppression fields due to their high saturation magnetization, excellent chemical stability, and corrosion resistance. The composite powders were the effect of the volume fraction of PANI on the frequency dispersion characteristics of the complex permittivity (ϵ' & ϵ''), permeability (μ' & μ'') and EMI SE properties were studied and the obtained results were discussed in the paper.



19-20-3



NON-ASSOCIATIVE BEHAVIOR OF THIOPHENOLS: TROUTON'S RULE, RAMSEY-SHIELDS- EÖTVÖS EQUATION AND APPLICATION OF HAMMETT EQUATION TO THE SURFACE TENSION DATA – A CHEMICAL EDUCATION PERSPECTIVE

R. Sanjeev¹, David Geelan² and V. Jagannadham^{3*}

Abstract

Non-associative behavior of thiophenols is explained on the basis of Trouton's rule, proton acceptor-donor cites and application of Hammett equation to the surface tension data of thiophenols.

Keywords

Trouton's rule, Proton acceptor-donor cites, Hammett equation

Comportamiento no asociativo de los tiofenoles: regla de Trouton, ecuación de ramsey-shields-eötvös y aplicación de la ecuación de Hammett a los datos de tensión superficial: una perspectiva de educación química

Resumen

El comportamiento no asociativo de los tiofenoles se explica sobre la base de la regla de Trouton, las citas del donante aceptor de protones y la aplicación de la ecuación de Hammett a los datos de tensión superficial de los tiofenoles.

Palabras clave

La regla de Trouton, las citas del donante aceptor de protones, la ecuación de Hammett

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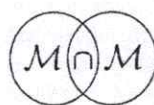
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Research Paper

Effect of Chemical Reaction on Bioconvective Flow in Oxytactic Microorganisms Suspended Porous Cavity

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Received July 13 2019; Revised October 04 2019; Accepted for publication October 11 2019.

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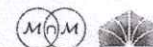
Abstract. In this paper, the bioconvective flow in a porous square cavity containing oxytactic microorganism in the presence of chemical reaction is investigated. The bioconvection flow and heat transfer in porous media are formulated based on the Darcy model of Boussinesq approximation. The governing partial differential equations are solved using the Galerkin finite element method. The computational numerical results are exhibited by the streamlines, isotherms, isoconcentrations of oxygen, isoconcentrations of microorganisms, average Nusselt number, average Sherwood numbers of oxygen concentration and microorganisms. The effects of key parameters such as bioconvection Rayleigh number (Rb), chemical reaction parameter (Kr) and thermal Rayleigh number (Ra) are presented and analyzed. It can be deduced that the chemical reaction reduces the strength of isoconcentrations of both oxygen and microorganisms. It has been revealed that the chemical reaction has a greater effect on the swimming of the microorganisms, average Nusselt number, and average density number.

Keywords: Thermo-bioconvection, Oxytactic Microorganisms, Porous square cavity, Chemical reaction, Finite Element Method.

1. Introduction

Abundant investigations on convective heat transfer in porous media are ascribed to the enormous of applications, such as utilization and storage of thermal/geothermal energy, reservoirs of petroleum, devices of catalytic converters, dispersion of underground pollutants, underground feeder cables, technology of porous ceramic burners, food industry, tertiary recovery, chemical reactors, chemical separations, moisture migration in stored grain, thermal cooling of electronic equipment, , heating of rooms, combustion, etc. The basic nature and the increased volume of work in this area are adequately archived in the books by Nield and Bejan[1], Ingham and Pop [2], Vafai[3], Pop and Ingham [4]. Natural convection in cavities of various geometries discovers a salient feature for engineering analysis. It has huge applications in engineering, such as solar applications, building applications, electronic industry, etc. Natural convection phenomena in the porous square cavity are investigated by Rahman et al.[5] and Balla et al. [6-8]. The latest development for microfluidic devices is heat transfer in porous media with bioconvection phenomena. Bioconvection refers to a macroscopic convective movement of fluid-induced by the swimming of motile microorganisms. Different types of microorganisms can be found, showing various swimming behaviours. Negatively geotactic microorganisms swim

Published online: December 03 2019



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Bioconvection in oxytactic microorganism-saturated porous square enclosure with thermal radiation impact

Chandra Shekar Balla¹ · Alluguvelli Ramesh² · Naikoti Kishan³ · A. M. Rashad⁴ · Z. M. A. Abdelrahman⁵

Received: 20 July 2019 / Accepted: 1 November 2019
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Abstract

This investigation addresses bioconvection of oxytactic microorganisms in a porous square enclosure by thermal radiation impact. The bioconvection flow and heat transfer in porous media are formulated based on Darcy model of Boussinesq approximation. Appropriate transformations lead to the non-dimensionalized governing partial differential equations. Galerkin finite element method for the resulting equations is computed. The role of relevant parameters on the streamlines, isotherms, isoconcentrations of oxygen and microorganisms and average Nusselt number is analysed in the outputs. It is revealed that the flow intensity of bioconvection is pronounced with larger Rayleigh number and reduced with radiation parameter. Furthermore, the temperature distribution is affected significantly with Rayleigh number. Radiation parameter serves to fasten the heat transfer in the enclosure. Oxygen density is enhanced with Rayleigh number and radiation parameter. The profile of motile isoconcentrations is boosted with Rayleigh number. The stability of microorganisms is improved with the radiation parameter.

Keywords Thermo-bioconvection · Oxytactic microorganisms · Thermal radiation · Porous square cavity · Finite element method

List of symbols

b Chemotaxis constant, m
 C Concentration of oxygen
 C_{\min} Minimum concentration of oxygen required for microorganisms to be active
 C_0 Concentration at free surface
 C_p Specific heat at constant pressure
 D_C Diffusivity of oxygen, $m^2 s^{-1}$
 D_n Diffusivity of microorganisms, $m^2 s^{-1}$
 g Acceleration due to gravity, $m s^{-2}$

K Permeability of the porous medium
 k^* Mean absorption coefficient
 L Length of porous cavity, m
 Le Lewis number
 n Number density of motile microorganisms
 n_0 Average density of the microorganism
 N Dimensionless number density of microorganisms
 Nu_Y Local Nusselt number
 Nu_{avg} Average Nusselt number
 Nn_Y Local Sherwood number of microorganisms
 Nn_{avg} Average Sherwood number of microorganisms
 p Excess pressure above hydrostatic
 Pe Peclet number
 q_r Radiative heat flux
 Ra Rayleigh number of porous medium
 Rb Bioconvection Rayleigh number
 Rd Radiation parameter
 Sh_Y Local Sherwood number of oxygen concentration
 Sh_{avg} Average Sherwood number of oxygen concentration
 T Temperature, K
 T_H Temperature at hot wall, K
 T_C Temperature at cold wall, K
 T_∞ Ambient temperature, K
 u, v Velocity components in x, y -directions, $m s^{-1}$

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Published online: 13 November 2019

Springer

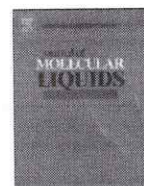
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Contents lists available at ScienceDirect

Journal of Molecular Liquids

journal homepage: www.elsevier.com/locate/molliq

Investigation of temperature dependent dielectric relaxation studies of 1,4-Butanediol/DMSO binary mixtures at the microwave frequency



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ARTICLE INFO

Article history:

Received 2 September 2019

Received in revised form 13 November 2019

Accepted 21 November 2019

Available online 26 November 2019

Keywords:

Complex dielectric permittivity

Dielectric relaxation

Excess parameters

Dipole moment

DFT calculations

ABSTRACT

In the present manuscript, we are reporting the complex dielectric permittivity of 1,4-Butanediol/Dimethylsulfoxide binary mixtures for entire concentrations in the temperature range of 298.15 K–323.15 K. The complex dielectric permittivity is measured in the frequency range of 20 MHz–20 GHz. The dielectric relaxation time (τ) of the binary mixtures are analyzed by using the Havriliak-Negami equation. Redlich-Kister polynomial equation is used to fit the excess molar volume (V_m^E), excess permittivity (ϵ^E), excess refractive index (n_D^E), excess inverse relaxation time ($1/\tau^E$). The molecular association and structural packing in the liquid mixture are analyzed by using thermal expansion coefficient (α_p) parameter. The ordering nature of the molecular dipoles is discussed by evaluating the Kirkwood correlation factor (g^{eff}) and stability of the system by thermodynamic quantities. The experimental dipole moments of the pure and equimolar binary system are determined by using Higasi's method and compared with the theoretical dipole moment values obtained from DFT/B3LYP methods. Confirmation of hydrogen bond between 1,4-butanediol and DMSO is supported with the FT-IR and UV-Vis spectroscopy methods. The experimental dielectric and spectroscopic studies confirm the existence of hydrogen bond between the liquid mixtures.

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1. Introduction

The interaction of electric energy with the material mainly depends upon the characteristic property of the material, which plays a significant role in the determination of structural properties of the compounds. The usage of microwave heating has become important in the field of food processing, synthesis of chemical compounds, local heating of the biological tissues and medicinal industry [1–5]. The capability of the material to absorb microwave energy depends upon the macroscopic permittivity, which is connected with the dielectric loss of the material [6,7]. By choosing the proper polar solvent in the chemical industry can stimulate or prevent the chemical reaction, and modify the structural dynamics of the system. Hence, the study of dielectric properties of the polar liquids in the microwave frequency region is very much important in understanding the applications of microwave energy. The dielectric study of the liquid mixtures having the hydrogen bond donor and acceptor group compounds is useful for a various number of applications in the field of biological, medical, material science and technology [8,9].

Dielectric relaxation studies of 3-Nitrotoulene with diethylacetamide, dimethylsulfoxide binary mixture are studied by Ajay Chaudhari et al. [10] and their studies reveal that effective dipoles rotate slowly in the mixture due to the hindering field produced by the multimers in the solution. The equilibrium properties of butanediols and temperature dependence of shape factor is studied by Zhuravlev et al. [11] and explained that relaxation time depends upon the structural rearrangement of the molecules in the solution. The homogeneous and heterogeneous interaction between a series of three butanediols with 1,4 dioxane is studied by Gilani et al. [12–15] and dipropylsulfoxide in aqueous medium by Gabrielyan et al. [16]. Their studies confirm the presence of hydrogen bonding in the solutions affecting the excess dielectric parameters. The acoustic and thermodynamic properties of butanediols with respective pressure and temperature studied by Edward Zorebski et al. [17] and they reported that thermal expansion, compressibilities are increased with increase in the chain length of the molecules. The average number of hydrogen bonds, bonding energy associated with alcohol-DMSO mixtures are evaluated by Jia Guo-Zhu et al. [18,19] and chemical stability, the reactivity of the anilines, phenols in a nonpolar solvent medium by computational HOMO and LUMO calculations [20]. Molecular dynamics of the hydrogen bond network in the ethanol-water mixtures are reported by

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Research Article

Numerical Approach for Differential-Difference Equations with Layer Behaviour

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Abstract.

difference equations having layer behaviour, with delay as well advanced terms. The retarded terms second order singular perturbation problem. A finite difference scheme using non polynomial spline of the first derivatives. Tridiagonal algorithm is used to solve the resulting system. The method is exemplified on numerical examples with various values of perturbation, delay and advance parameters.

Also, the convergence of the proposed method has also been established.

Keywords.

absolute error

MSC. 65L10; 65L11; 65L12

Received: October 22, 2019

Accepted: November 9, 2019

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1. Introduction

and in the potential in nerve cells by random synaptic inputs in dendrites [18].

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Available online at <http://scik.org>

J. Math. Comput. Sci. 10 (2020), No. 3, 479-496

<https://doi.org/10.28919/jmcs/4433>

ISSN: 1927-5307

19-20-13

FITTED DIFFERENCE APPROACH FOR DIFFERENTIAL EQUATIONS WITH DELAY AND ADVANCED PARAMETERS

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Abstract: A difference scheme involving acceptable fitting parameters is suggested for differential equations with delay and advanced terms, the solutions of which show boundary layer behaviour. First, the original problem is reshaped into asymptotically comparable second order singular perturbation problem using Taylor series approximation for the retarded terms. In order to obtain precise solution, fitting parameters are introduced in difference scheme using modified upwind differences for the first order derivatives. Thomas procedure is used to solve the resulting tri-diagonal difference system. The method is tested on numerical examples for various values of the perturbation, delay and advance parameters. Computed maximum absolute errors are tabulated. Numerical experiments are shown in graphs and the effects of small shifts have been studied on the boundary layer region. Also, convergence has been established of the proposed method.

Keywords: boundary layer; delay and advance parameters; modified upwind; singular perturbation problem.

2010 AMS Subject Classification: 65L10, 65L11, 65L12.

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Received December 17, 2019

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Do phase transition temperatures T_{mp} and T_{bp} obey linear free energy relationships?

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ARTICLE INFO

Article history:

Received 12 December 2019
Received in revised form 5 January 2020
Accepted 12 January 2020
Available online 13 January 2020

Keywords:

Melting points
Boiling points
Hydrogen bonding
Aliphatic alcohols
Aliphatic amines
Aliphatic fluorides
Aliphatic hydrocarbons
Taft equation

ABSTRACT

Normal melting point of a solid is the temperature at which it changes its state from solid to liquid. At the melting point the solid phase and the liquid phase exist in equilibrium. And normal boiling point of a liquid is a property at which the vapor pressure of the liquid becomes equal to the atmospheric pressure. The four types of intermolecular forces: hydrogen bonding, ionic forces, Van der Waals dipole-dipole interactions and Van der Waals dispersion forces (London forces) and sometimes the polarizability affect the melting and boiling points. Hydrogen bonding is one of the key factors that largely affect both melting and boiling points of solids and liquids respectively having functional groups such as OH, NH₂ and a most electronegative atom F. And they are also affected by polar electronic effects of the substituents and by the size of the molecule due to the presence of the van der Waals attractions. Using Lindemann's equation $T_{mp} = \frac{4\pi^2 m v^2 c^2 a^2}{k_B}$ and strong foundation of Trouton's two empirical rules $\Delta S_{latent} = \frac{\Delta H_{latent} \times \text{Density}}{273 + T_{mp}}$ and $\Delta S_{vaporization} = \frac{\Delta H_{vaporization}}{273 + T_{bp}}$, Taft Linear Free Energy Relationship (LFER) is applied to the temperature of phase transitions (solid to liquid and liquid to vapor) of alkyl alcohols, alkyl amines, alkyl fluorides and aliphatic hydrocarbons. Two loci are observed in each case one with a negative slope for electron donating substituents and the other with a positive slope for electron withdrawing substituents with a minimum at CH₃ substituent (Taft $\sigma^* = 0.00$). The decreasing trends in both the melting and the boiling points with decrease in electron donating power of substituents and the increasing trends in both the melting and the boiling points with increase in electron withdrawing power of substituents are explained with two interpretations of hydrogen bonding in alcohols, amines and fluorides yielding the same dimers.

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1. Introduction

The astonishing efforts in the direction of application of LFER to various physical properties like surface tension (γ) [1–8], dipole moments (μ) [8] and melting points [9] from our laboratory have ever been increasing with a good degree of success. Quantitative solubility-structure relationships for several *meta*- and *para*-substituted benzoic acids in benzene and in cyclohexane [10] and in 1, 4-dioxane and *tetra*-hydrofuran (THF) [11] were studied. Even the application of Hammett equation to melting points of some benzene derivatives were touched and left without any reasonable arguments [12]. Katritzky

et al. gave a one line concluding argument on the application of QSPR models to the melting points of benzene derivatives in terms of molecular packing and intermolecular interactions [13]. There was a brief report on the application of Hammett equation to the dipole moments [14].

Schreck [15] had described this in an article on non-linear Hammett relationships as what appears to be the only physical property that gives non-linear Hammett plots. But solubilities are not completely physical properties as the solubility would be a function of ionizing capacity and ionization is a chemical property which depends on the dielectricity of the solvent and it will be taking place at a **localized ionization site**. This gets support from the variation of Hammett ρ with solvent polarity [16,17].

It is from our laboratory who uncorked the detailed application of LFER to purely physical properties like surface tension (γ) [1–8], dipole moments (μ) [8] and melting points [9] except its mention on

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Short Communication

Is interfacial tension of a liquid-air interface thermodynamically a cyclic process?

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ARTICLE INFO

Article history:

Received 27 May 2019

Received in revised form 19 October 2019

Accepted 13 November 2019

Available online 14 November 2019

Keywords:

Brønsted equation

Taft equation

Interfacial tension

Surface tension

Cyclic process

ABSTRACT

Brønsted ($\log k_B = \beta \text{p}K_a^{\text{H}^+} + C$) and Taft ($\log k = \rho^* \sigma^* + \log k_0$) linear free energy equations are applied to the interfacial tension data of N-substituted anilines. The significance of the values of the constants Brønsted β (0.096) and Taft ρ^* (0.091) are explained in terms of proton transfer from the acid to the aniline, which is accelerated by electron donating groups. The deprotonation of protonated aniline is accelerated by electron withdrawing groups. Since any thermodynamic property associated with any kind of reaction is a point group, the fact that Brønsted β and Taft ρ^* have similar values with opposite sign indicates that the total process taking place at the aniline-air interface is a cyclic one.

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1. Introduction

Our laboratory has for some time had an interest in the application of Linear Free Energy relationships to surface tension data [1–5] and to the nucleophilic solvation of aliphatic ammonium ions [6]. In the present article we apply the Brønsted and Taft equations to the interfacial tensions of some N,N-disubstituted anilines. To our knowledge this is the first time this analysis has been reported in the literature. The opposite signs and similar values of the trend lines of Brønsted β and Taft ρ^* are explained based on thermodynamic considerations.

2. Experimental data source

Data on the interfacial tensions of N,N-disubstituted anilines is from reference [7] and references cited therein. The $\text{p}K_a$ and Taft σ^* values of N,N-disubstituted anilines are from reference [8]. All linear correlations were completed using KaleidaGraph software. Fig. 1 was drawn using ChemDraw.

3. Discussion

The main difference between surface tension and interfacial tension is that surface tension is defined in terms of a single liquid surface which is in contact with a gas phase, usually air. Interfacial tension, on the other hand is understood as occurring at the interface of two immiscible liquids. Surface tension is actually a derivation of interfacial tension where the force resulting from the second surface is negligible or zero. The surface tension of a pure liquid is simply the interfacial tension at the liquid-air interface, because the surface tension of air is zero. This is the case because surface tension needs a surface, and for a surface there must be two different phases in contact with each other. Gases do not form inter-phase surfaces. Surface tension is caused by intermolecular forces that keep molecules in a liquid together. Such forces do not exist or are negligible in the gas phase as the gas thermodynamically is assumed to be a very dilute system.

Fig. 1 shows a typical example of an aniline-air interfacial system.

Air always contains small amounts of carbon dioxide which dissolves in the moisture present in the air making it slightly acidic, with a pH of 5.7. This becomes a source of protons (H^+):



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19-20 - 16



Contents lists available at ScienceDirect

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy

journal homepage: www.elsevier.com/locate/saa

Frequency and temperature dependent dielectric studies of propylene glycol-sulfolane binary mixtures in the microwave frequency region

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ARTICLE INFO

Article history:

Received 18 November 2019

Received in revised form 14 February 2020

Accepted 20 February 2020

Available online 22 February 2020

Keywords:

Dielectric relaxation

 g^{eff} factor

Helmholtz free energy

DFT

HOMO-LUMO calculations

ABSTRACT

The dielectric permittivity of propylene glycol/sulfolane binary mixtures have been determined at various temperatures in the frequency range of $0.02 \nu/\text{GHz} \sim 20$ using open-ended coaxial probe method. The permittivity spectra of propylene glycol/sulfolane mixtures with an asymmetric shape is observed. The experimental dielectric permittivity, relaxation time values are used to obtain remaining excessive parameters such as excess permittivity (ϵ^{E}), deviation in refractive index (Δn_{D}) excess inverse relaxation time ($1/\tau^{\text{E}}$), Kirkwood effective correlation factor (g^{eff}) and active thermodynamic parameters. Redlich-Kister polynomial equation is used to fit the excessive dielectric parameters. The molecular interaction between propylene glycol and sulfolane binary mixtures is interpreted in terms of short and long-range interactions among the dipoles. The experimental dipole moment values are compared with the theoretical dipole moment values from DFT/B3LYP, MP2 methods. Natural bond orbital (NBO) analysis is performed on the optimized geometrical structure of the above system to understand molecular interaction between the binary mixtures in terms of hydrogen bonding. The chemical stability of the system is studied from the HOMO-LUMO calculations. The energy of H-bond interaction between propylene glycol and sulfolane binary mixture is calculated from the single point energy calculations, and the results are correlated.

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1. Introduction

The temperature and frequency dependent dielectric relaxation studies of liquid mixtures play a significant role in the investigation of various processes such as intra and intermolecular interactions, rotational dynamics of the molecules, interfacial polarization, relaxation process, solute-solvent interactions and strength of the interaction among the dipoles. The study of interest in carrying the dielectric spectra of binary and ternary liquid mixtures resides in analyzing the molecular dynamics of the systems and describing the possible variation from the pure components of the liquids and their ideal mixtures. The non-covalent interactions present in the liquid systems such as hydrogen bond, Van der Waals, and electrostatic forces play an essential role in the field of biological activity, enzyme catalysis, and drug design [1]. The dielectric studies of different polar binary mixtures at different concentrations and temperature lead to analyze the strength of the hydrogen bond interaction in terms of thermodynamic parameters, ordering nature of the dipoles and their mutual interactions [2–6]. The dielectric relaxation spectroscopy is one of the sensitive methods to detect small changes occur in the structural parameters of a molecule in a liquid

system. Several researchers performed dielectric studies on different liquid compounds in water as well as in alcoholic medium in recent past [7–17], at the same time molecular simulations are also performed to interpret experimental results [18–22]. The different spectroscopic studies such as FT-IR, proton NMR, and Neutron diffraction studies are also carried by the researchers to confirm the existence of hydrogen bond between the different liquid mixtures [23–25].

The present work is in continuation of our systematic studies in order to understand the molecular interaction between binary mixtures of propylene glycol and sulfolane. In our previous paper [43] (Vishwam et al.), we reported the molecular interaction behaviour of propylene glycol in ethanol medium and the data is interpreted in terms of thermodynamic parameters, strength of the hydrogen bond interaction from the single point energy method.

In the present manuscript, we are interested to analyze the effect of sulphonyl group on the dielectric relaxation process of propylene glycol medium. The molecular interaction of sulfolane in propylene glycol is studied in terms of short and long-range ordering of the dipoles, excess molar volume (V_m^{E}), molar polarization (P_m), Natural Bond Orbital analysis to identify the position of hydrogen bond. The chemical stability of the molecule is studied by Highest Occupied Molecular Orbital and Lowest Unoccupied Molecular Orbital (HOMO, LUMO) calculations and Redlich-Kister polynomial fitting procedure for excess dielectric

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Microstructure, frequency and temperature dependent dielectric properties of zinc ferrites

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ABSTRACT: Ferrite with the general formula $ZnFe_2O_4$ was prepared by microwave hydrothermal (M-H) method. The as-synthesized powder was pelletized and samples were sintered at different temperatures (600, 700, 800 and 900°C). The grain size was varied by sintering the ferrite at different temperatures up to 900°C. The characterization studies were conducted by X-ray diffraction (XRD) and scanning electron microscopy (SEM). Dielectric constant (ϵ') and dielectric loss tangent ($\tan \delta$) were measured as a function of frequency and temperature DC conductivity (σ_{ac}) was measured by temperature variation. A significant influence of sintering temperature on the microstructure and electrical properties was detected.

1. INTRODUCTION

Nanoscale magnetic particles are attracting more interest in the scientific community because of its efficient applications in color imaging, catalysis, data storage, drug delivery, ferrofluids and magnetic refrigeration systems [1].

Spinel ferrites are commercially important materials because they're excellent electrical and magnetic properties [2]. These classes of materials have been the subject of extensive studies by physicists and chemists alike. A whole range of distribution of cations is possible in spinels which can be represented generally by the formula $(Me^{2+})_d Fe^{3+}_{1-d} (Me^{2+})_{1-d} Fe^{3+}_{1+d} O_4$ where the ions inside the brackets are said to occupy octahedral sites (B) and the ions outside the bracket occupy the tetrahedral sites (A) [3]. In the above formula when $d=1$, it is called normal spinel. When $d=0$ it is called an inverse spinel. When $d=1/3$ it is called random spinel. From the fundamental point of view, these materials serve as ideal candidates for studying ferrimagnetism and ferromagnetic properties.

Zinc ferrite belongs to the normal spinels [4]. The properties of zinc ferrites have been the subject of study by many investigators over the last two periods. It has been established that structurally $ZnFe_2O_4$ is a normal spinel where it can be written as $[(Zn^{2+})_A](Fe^{3+})_B O_4$ and its net magnetization is zero. Research on zinc ferrite showed that zinc ferrite is antiferromagnetic because of B-B interactions with a Neel temperature of about 10 K. It behaves as a paramagnet above the Neel temperature [5]. The abnormalities in the magnetic properties of zinc ferrite have been reported [6]. For case, Lotgering et al. [6] detected abnormal behavior in the paramagnetic susceptibility of zinc ferrite. In their neutron diffraction studies, Brockhouse and others [7] found the presence of a short-range order of parallel spins separated by 0.29 nm.

In the present investigation, the nanopowder of $ZnFe_2O_4$ was prepared using M-H method. The advantage of M-H method is given elsewhere [8]. The as-prepared powder was characterized using XRD, and SEM, frequency and temperature dependent dielectric properties (ϵ) and conductivity properties were studied and discussed in this paper.

2. EXPERIMENTAL METHOD

Pure zinc nitrate $[Zn(NO_3)_2 \cdot 6H_2O]$ and iron nitrate $[Fe(NO_3)_3 \cdot 9H_2O]$ were dissolved in 100 ml of de-ionized water. The molar ratio of powders was adjusted to obtain the composition $ZnFe_2O_4$. An aqueous NaOH solution was added to the mixture until the desired pH (~9.45) value was obtained. The precipitate was transferred into an autoclave and was treated with M-H method. In this method, the precipitate was taken into Teflon lined vessel and placed inside the microwave digestion system (Model MDS-2000, CEM Corp., Mathews, NC) and samples were synthesized at 165°C/45 min. Our M-H system is fully computer controlled one and uses 2.45 GHz microwaves and can be operated at 0-100% full power (1200±50W). The products obtained were filtered and then washed repeatedly with de-ionized water, followed by freeze-drying overnight. The prepared powders were weighed and the percentage yields were calculated from the expected and the amount that was actually



Computational and experimental analysis of LiFePO_4/C cathode material for lithium ion battery applications

Cite as: AIP Conference Proceedings **2269**, 030047 (2020); <https://doi.org/10.1063/5.0019659>
 Published Online: 12 October 2020

Subhashini Vedala, M. Sushama, and M. Aruna Bharathi



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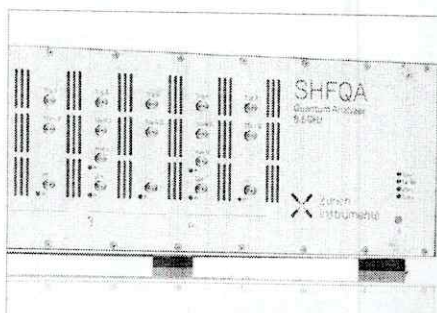
AIP Conference Proceedings **2269**, 030048 (2020); <https://doi.org/10.1063/5.0019660>

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Computational and Experimental Analysis Of LiFePO₄/C Cathode Material For Lithium Ion Battery Applications

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Abstract. The present research work, First principles calculations have proven to be outstanding tools to laboratory experiments in research because they can calculate some characteristics of a modeled system that are very hard to obtain experimentally. First principles calculations (CASTUP) also offer far greater ability to control and manipulate a system, providing the modeled system reflects the real system accurately. calculations and their applications in the research of positive electrode materials were studied. An economical and novel method for synthesis of Nano porous LiFePO₄/C composite by glycine and urea assisted combustion method with fuel to oxidizer ratio $\Psi = 1$. The average crystallite size of obtained LiFePO₄/C composite from x-ray diffraction is 40-45nm. Morphological studies were done using scanning electron microscope the structure of the surface coated carbon and the material were investigated by Raman spectroscopy. The structure of the material at the molecular size scale has been investigated by FTIR transmittance and Thermal Analysis and stoichiometry analysis for Fuel to nitrate ratio for urea and glycine and for various molarities and there balancing equations and calculation for Enthalpy of combustion and adiabatic flame temperature results were present.

INTRODUCTION

In The future use of electrical energy dangles on the development and optimization of the next generation secondary ion batteries [1]. Batteries are incorporated in almost all portable electronic devices rely on energy stored chemically in them [2]. The key to achieving that objective may lie on Stoichiometric optimization and synthesizing the cathode material using chemical methods for battery applications.

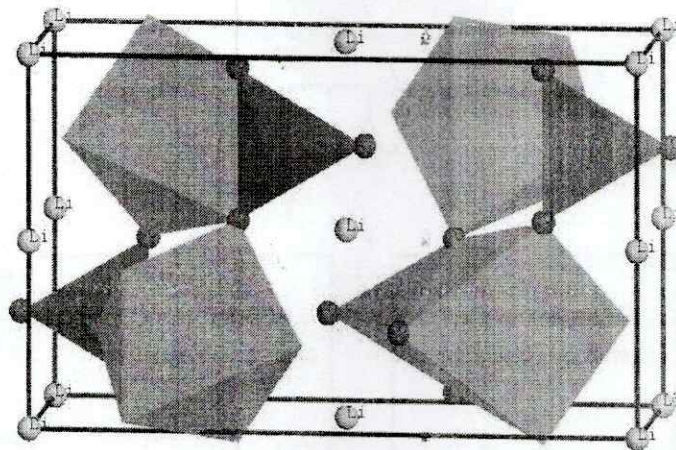


FIGURE.1 Crystal Structure of LiFePO₄ Nanocomposite Material.

Design and analysis of grading high plate type spacer in a single phase gas insulated busduct for reduction of electric field stress

Cite as: AIP Conference Proceedings 2269, 030046 (2020); <https://doi.org/10.1063/5.0019502>
Published Online: 12 October 2020

K. Sushma, G. V. Nagesh Kumar, M. Aruna Bharathi, and Sravana Kumar Bali



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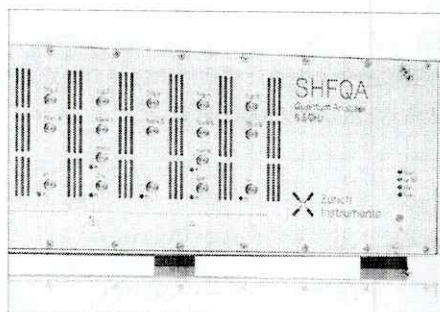
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Design and Analysis of Grading High Plate Type Spacer in a Single Phase Gas Insulated Busduct for Reduction of Electric Field Stress

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Abstract. Spacers are a key component of the gas-insulated structures. Most dielectric instances intensity collapses and ground flashover are attributed to distinguish the failures of spacer. Such Failures are due to non-uniformity distribution of electric field around the top of the spacer and high field tension at triple junctions. For a better electric field distribution, precise structure simulation of the spacers is important as it improves the component's existence. Rare pressure management results in problems such as moulding and manufacturing by shape modeling. In this paper, a graded high FGM insulating spacer is designed for a Single phase GIS for reduction of electric field stress. Stress in the electrical field for different values of high grading the FGM material is measured and the insertion of metal inserts is used to reduce the electrical field pressure.

INTRODUCTION

The severity of the electrical field distribution emerging it's growing within the GIS. The additional significance for analysis as the GIS becomes additionally lightweight. Out Of all the components inside GIS the electrical field stress formed on the surface insulating supporter connected between inner conductor and the outer conductor, influences the quality of GIS insulation. Strong field strains the spacer's surface, might lead to surface electric arc over an amount of your time. Junction shaped by the conductor, gas insulation and solidity dielectric at high voltage and ground conductor ends known as Triple Junction (TJ). This TJ is a different one, essential space wherever high force field stresses can lead to partial discharges. This might more result into surface electric arc on the spacer surface. Spacers are one amongst the essential elements in GIS liable dielectric breakdown of material strength and surface electric arc, injecting the necessity in the development of safe and reliable electric spacers for the cost-effectiveness of GIS. The field experiments were carried out on the spacer surface thought about in concert of the live in assessing the spacer output.

LITERATURE REVIEW

Perry, E.R [1] et al reviewed various insulator shapes such as sleek disk, furrowed disk and cone quality. It is seen that the cone type spacer has considerable potential. Dielectric corrosion can gradually reduce the power of the insulator. Misaki, T [2] et al thought-about a significant downside is the native field intensification on a cone-type spacer mounted all SF6-insulated flanges. The improved structure with the spacer's surface form and speaking to slightly modified position proved beneficial in increasing the intensification of native fields.

To date, several techniques have been applied to improve the insulation efficiency and the electrical strength of sensitive gas-insulated switchgears. Such methods, though, create a lot of sophisticated pure mathematics in the

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Cite as: AIP Conference Proceedings 2269, 030045 (2020); <https://doi.org/10.1063/5.0019504>
Published Online: 12 October 2020

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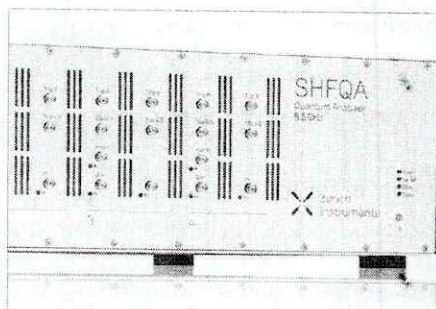
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Field Stress Control of a Post Type Grading Low Insulating Spacer with Functionally Graded Material in a Gas Insulated Bus duct

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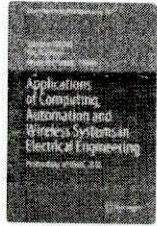
Abstract. High voltage electrical systems are plagued by certain problems, such as high stress delivery and damage to insulation, which are necessary to ensure efficient network service. High pressure on the spacer surface in a gas-insulated bus duct is a major factor influencing the insulation strength, particularly at the conductor, insulator and gas contact point (called triple junction). Research studies of spacer shaping have been found to be effective in managing pressure distribution but difficult in real-time applications. In this paper, for the regulated field stress division on the spacer layer, dynamically graded post-type spacer materials with dissimilar low graded permittivity are planned. Electric field calculations for low graded materials are performed and a uniform distribution of stress along the spacer is achieved by correctly designed metal inserts integrated in GIS.

INTRODUCTION

As the GIS gets closer, the degree of electrical stress in the field that have been develop inside the GIS becomes extra important for learning. The electrical field pressure produced on the insulator surface acts as a buffer within the external enclosure for the inner conductor. Sometimes it may result in flash over time due to Strong field pressures on the spacer interface. The high voltage junction is created due to electrode, the gas and the solid insulator and the neutral enclosure ends of the support insulator called TJ. High electric field stresses at TJ can cause partial discharges to be initiated, so it is considered a critical area. This results in flashing of the surface along the spacer surface. Spacers are among the most critical key components of GIS. These are accountable for collapse of dielectric Power and memory surface, introducing the want for efficient GIS quality in the development of stable and flashover free spacers. Field One of the field studies along the spacer surface measurements when assessing the efficiency of the spacer. Few researchers examined the quality of different insulator shapes such as smooth disks, corrugated disks and a cone. It is seen that the cone type spacer has considerable potential. Contamination with the insulator weakens the dielectric stress. The main problem considered is the intensification of the field analysis on the surface of the spacer form spacer that is mounted in SF₆-gas -insulated system between flanges.

The improved design with the spacer's surface form and slightly changed contact location was successful in reducing the intensification of the local field. In order to improve insulation performance and unwind the electrical field intensity various techniques have been applied in practical gas insulated switch gears [1-6]. A new technique functionally graded materials (FGM) based technique has been implemented in new years. It is suggested to improve the voltage breakdown of the solid insulators, while keeping the structure simple. It is proposed to improve the voltage breakdown of the solid insulators, while keeping the structure simple. Okubo Group suggested the use of

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Applications of Computing, Automation and Wireless Systems in Electrical Engineering pp 383–392

Krill Herd Algorithm for Solution of Economic Dispatch with Valve-Point Loading Effect

Harish Pulluri, N. Goutham Kumar, U. Mohan Rao, Preeti
 & Mekala Girish Kumar

Conference paper | First Online: 01 June 2019

925 Accesses | 1 Citations

Part of the Lecture Notes in Electrical Engineering book series (LNEE, volume 553)

Abstract

The article presents a novel bio-inspired Krill Herd (KH) algorithm to solve economic dispatch problems. KH algorithm is based on crowding behavior of the krill individuals and achieves a near global optimum solution by using three main actives. The proposed algorithm is tested by considering three and six generating unit systems on different loads on objective function. The attained results have proved that the KH algorithm provides remarkable results as compared with the


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ISSN NO. 2320-5407

Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/10439

DOI URL: <http://dx.doi.org/10.21474/IJAR01/10439>

RESEARCH ARTICLE

AN ANALYTICAL STUDY ON NPAS OF STATE BANK OF INDIA

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Manuscript Info

Manuscript History

Received: 01 December 2019

Final Accepted: 03 January 2020

Published: February 2020

Key words:-

Non-Performing Assets, State Bank of India (SBI), Merger, RBI Resolutions

Abstract

Objectives: The main objective of this paper is to make an attempt to analytically study the basic reasons for increase in NPAs/analyze gross NPAs in SBI group and the measures taken so far and their impact.

Method: Data is collected for the Variables namely Net Profit Margin, Return on Equity and Return on Assets, Gross NPAs to Gross Advances, Net NPAs to Net Advances, Cost to Income and Provision Coverage Ratio. Secondary data is collected for a period of 5 years i: e from 2014-15 financial year to 2018-2019 Financial Year. Statistical tool like percentage analysis is used to identify the reasons for increase in NPA's of State Bank of India.

Result: It was found in the study that, the major sectors contributed for the increase in NPAs in SBI are mid and Large corporates and not the priority sector. NPAs are increasing from the last five years as shown in the ratios calculated. This is due to change in the method of projecting NPAs and stringent norms by RBI.

Conclusion: The present paper analyzed and identified the reasons for increasing trend of NPAs in SBI group. SBI is in hope that it could see the development in coming years as they are expecting the resolutions for pending cases from the National Company Law Tribunal (NCLT).

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Introduction: -

Public banks in India had been facing the problem of stressed assets over the period of time in spite of many resolutions. Recently, Reserve Bank of India came with revised framework for the functioning of banks with respect to stressed assets. RBI has made some stringent norms for the treatment of bad loans. Now it is also planning to ease certain norms (for small and medium enterprises) without diluting the spirit with which it has initiated resolutions. SARFAESI - Securitisation, Reconstruction and Financial Assets and Enforcement of Security Interest Act 2002² was a significant step in the reforms in financial sector in India.

As per the reports of Standard and Poor, April 2018, India is in 55th place among the top 100 largest banks in the world in terms of total assets held.

Union cabinet in India has approved the merger of State Bank of India (SBI) with five of its associates in 2017 with an aim to reduce the cost to income ratio, to help Indian economy to rank higher in the global banking rate, to rationalize more resources etc.

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A Study on Impact of Working Capital Management on Profitability: A New Dimension from Indian Top Five Cement Companies' Perspective

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Abstract

Management of working capital is considered as a "three faces' coin" with each of inventory management, debtors (debtors + receivables) management along with credit suppliers and short-term lenders management. Still there exists a big tragedy between allocation of permanent (fixed) capital and circulating (working) capital. Even from the inception to incredible operations, firms are undergoing the mismatching status of working capital with respect to operational requirements. The present study encompasses the practical guide of WCM to the small cement producing firms in India, as this study has narrated the working capital policy management of largest cement companies in India. The results revealed that, in order to be considered as biggest companies in the Cement world, the selected firms need to strengthen their working capital position to reap more profits. From the analysis, it is clear that there exist a positive relation exist between profitability and components of WCM.

Keywords: return on capital employed (ROCE), current ratio, inventory holding period (IHP), debt collection period (DCP), debt payment period (DPP), and net working capital

1. Introduction –

1.1 Cement Industry [1] India is the silver medalist in production of cement on the globe. Indian cement industry is catering as one of the major industry to the economy and generating employment to more than 10,00,000 people. Since its deregulation, it has attracted a huge amount of FDI from multinational investors. India has a wider scope for its development especially in infrastructure building with the assistance of cement industry. Recent growth prospects like making 98 selected smart cities will push the cement industry in an upward direction. wcm ## working capital management

1.2 Introduction – Working Capital

It is a contest between the fixed capital and working capital allocation. In general lose-lose situations mostly observed repetitively in many of the firms irrespective of the industry nature and size with failure of predicting future conditions of the firm.

Allocation of excessive working capital or conservative working capital leads to collapse of reaching objectives. Hence it is very important to become considered as a financial manager, the optimum allocations by predicting future requirements of the firm along with conditions internally and externally.