DEPARTMENT OF M.SC. ORGANIC CHEMISTRY

DEPARTMENTAL REPORT 2019-20

I. Departmental Activities:

1. Orientation programme

a. Concept - Orientation programme for I year students on 19th Sept., 2019 at Loyola hall

b. Purpose - To acquaint the students with rules and regulations of the college

c. Report – Rector blessed the students, Principal and Vice principal extended their welcome and addressed the students

d. Reviews- Students showed positive response which is evident in their behaviour and discipline

2. Industrial visit

a. Concept - Five day trip for MSc II year students to NCL and C-MET-Pune from 26 September to 30 September 2019

b. Purpose - To have an exposure on latest developments in material science at CMET-Pune and analytical techniques involved in research field at NCL-Pune

c. Report- On 26 September 2019 at C-MET Pune, the visit started with a talk on E-Waste management. The students and the faculty were toured and explained about the functionalities of the various facilities which include Synthesis of Nano-materials by plasma technique facility, Li Ion battery fabrication facility, Solar cell fabrication lab, LTCC Packaging facility and Synthesis Lab.

d. 27 September 2019 at NCL-Pune, students observed and learned about the working of various instruments like X-PES, TEM, single XRD, mass spectrometry, HPLC, SEM and Ramam spectroscopy. Instrumentation, working, principle and applications of these were explained in detail. This was followed by sightseeing tour alibagh, mahabaleswar and Lonavala

e. Reviews- It was an knowledgeable educational trip

f. Photos.





Industrial visit to NCL and C-MET-Pune

3. PG Resonance

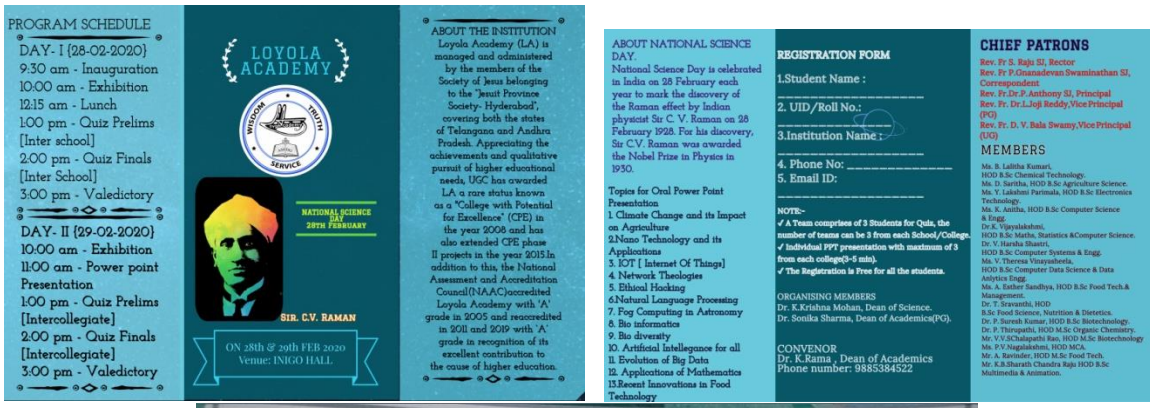
a. Concept - PG Resonance on 25th &26th January, 2019
b. Purpose - To bring out the hidden talents in the students
c. Report – Students activelyparticipated in various events like dance, drama, songs, mime, rangoli, mehendi, cooking without fire etc. The students were able to bag I&II prizes in few events
d. Reviews- The students were rejuvenated by the cultural atmosphere
e. Photos.

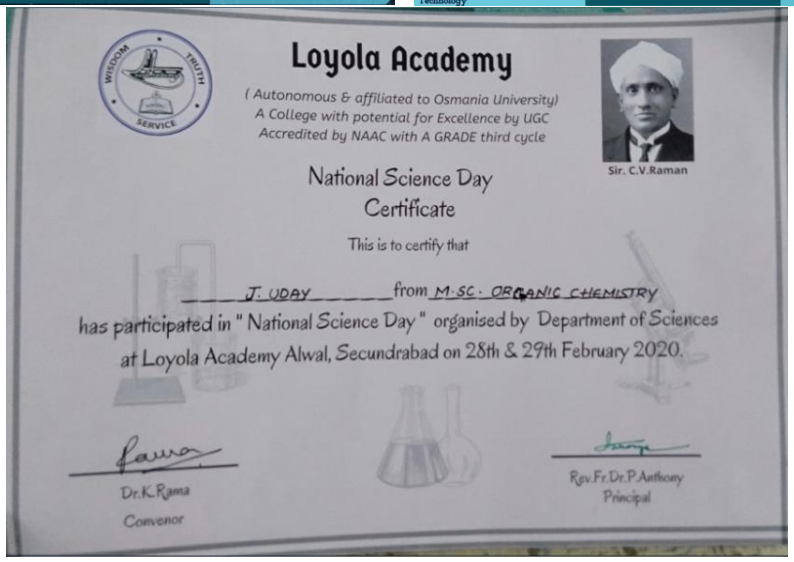
4. **Ongoing In-house Projects:**

a. Concept - Two months (25 February 2019 to 3 May 2020) in-house projects for II year students as part of the curriculum
b. Purpose - To get hand on experience and research exposure in chemistry
c. Report- Two students each of M.Sc II Year carrying out their project work under guidance of Dr. P Thiruapthi and Dr S,P,Mydhili

5. National Science Day:

a. Concept - National Science Day on 28 and 29 February 2020 in association with other science departments
b. Purpose - To encourage student towards science and technology
c. Report – Students actively participated and presented science models and demonstrated science experiments
d. Reviews- The students were encouraged and showed enthusiasm towards subject
e. Photos-





5. National Webinar:

a. Concept - A two day National Webinar-Techno Science-2020 on 27 and 28 May 2020 February 2020 in association with other science departments

b. Platform-Zoom and youtube live stream of two sessions

c. Purpose - To empower students and faculty on latest analytical techniques and their applications in various fields

d. Report – Students, faculty from our college /other colleges and research scholars from various orgnizations through out India actively participated.

e. Reviews- A successful webinar

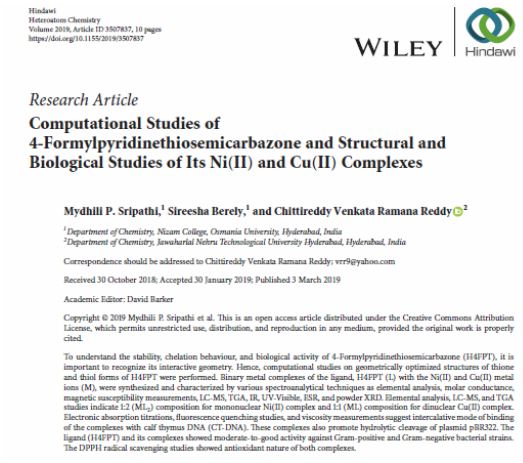
f. Photos-



II. Staff Achievements

a. Dr.S.P. Mydhili published Two research articles in international journals- Heteroatom chemistry and Russian Journal of General Chemistry

b. Photos



Hindawi
Heteroatom Chemistry
Volume 2019, Article ID 3507837, 10 pages
https://doi.org/10.1155/2019/3507837

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Research Article

Computational Studies of 4-Formylpyridinethiosemicarbazone and Structural and Biological Studies of Its Ni(II) and Cu(II) Complexes

Mydhili P. Sripathi,[1] Sireesha Berely,[1] and Chittireddy Venkata Ramana Reddy[2]

[1]*Department of Chemistry, Nizam College, Osmania University, Hyderabad, India*
[2]*Department of Chemistry, Jawaharlal Nehru Technological University Hyderabad, Hyderabad, India*

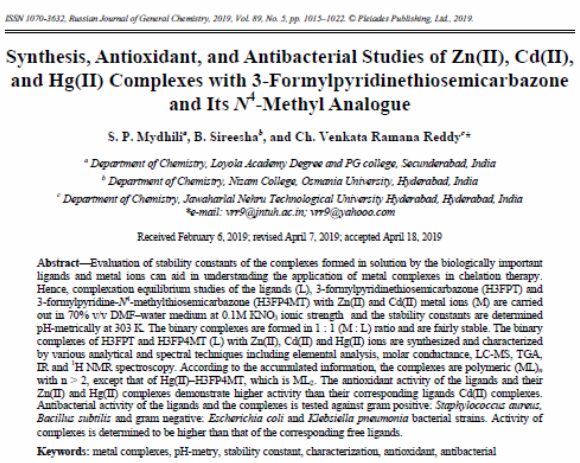
Correspondence should be addressed to Chittireddy Venkata Ramana Reddy; vrr9@yahoo.com

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To understand the stability, chelation behaviour, and biological activity of 4-Formylpyridinethiosemicarbazone (H4FPT), it is important to recognize its interactive geometry. Hence, computational studies on geometrically optimized structures of thione and thiol forms of H4FPT were performed. Binary metal complexes of the ligand, H4FPT (L) with the Ni(II) and Cu(II) metal ions (M), were synthesized and characterized by various spectroanalytical techniques as elemental analysis, molar conductance, magnetic susceptibility measurements, LC-MS, TGA, IR, UV-Visible, ESR, and powder XRD. Elemental analysis, LC-MS, and TGA studies indicate 1:2 (ML_2) composition for mononuclear Ni(II) complex and 1:1 (ML) composition for dinuclear Cu(II) complex. Electronic absorption titrations, fluorescence quenching studies, and viscosity measurements suggest intercalative mode of binding of the complexes with calf thymus DNA (CT-DNA). These complexes also promote hydrolytic cleavage of plasmid pBR322. The ligand (H4FPT) and its complexes showed moderate-to-good activity against Gram-positive and Gram-negative bacterial strains. The DPPH radical scavenging studies showed antioxidant nature of both complexes.



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Synthesis, Antioxidant, and Antibacterial Studies of Zn(II), Cd(II), and Hg(II) Complexes with 3-Formylpyridinethiosemicarbazone and Its N^4-Methyl Analogue

S. P. Mydhili[a], B. Sireesha[b], and Ch. Venkata Ramana Reddy[c]*

[a] *Department of Chemistry, Loyola Academy Degree and PG college, Secunderabad, India*
[b] *Department of Chemistry, Nizam College, Osmania University, Hyderabad, India*
[c] *Department of Chemistry, Jawaharlal Nehru Technological University Hyderabad, Hyderabad, India*
**e-mail: vrr9@jntuh.ac.in; vrr9@yahooo.com*

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Abstract—Evaluation of stability constants of the complexes formed in solution by the biologically important ligands and metal ions can aid in understanding the application of metal complexes in chelation therapy. Hence, complexation equilibrium studies of the ligands (L), 3-formylpyridinethiosemicarbazone (H3FPT) and 3-formylpyridine-N^4-methylthiosemicarbazone (H3FP4MT) with Zn(II) and Cd(II) metal ions (M) are carried out in 70% v/v DMF–water medium at 0.1M KNO_3 ionic strength and the stability constants are determined pH-metrically at 303 K. The binary complexes are formed in 1 : 1 (M : L) ratio and are fairly stable. The binary complexes of H3FPT and H3FP4MT (L) with Zn(II), Cd(II) and Hg(II) ions are synthesized and characterized by various analytical and spectral techniques including elemental analysis, molar conductance, LC-MS, TGA, IR and ^{1}H NMR spectroscopy. According to the accumulated information, the complexes are polymeric $(ML)_n$ with $n > 2$, except that of Hg(II)–H3FP4MT, which is ML_2. The antioxidant activity of the ligands and their Zn(II) and Hg(II) complexes demonstrate higher activity than their corresponding ligands Cd(II) complexes. Antibacterial activity of the ligands and the complexes is tested against gram positive: *Staphylococcus aureus, Bacillus subtilis* and gram negative: *Escherichia coli* and *Klebsiella pneumonia* bacterial strains. Activity of complexes is determined to be higher than that of the corresponding free ligands.

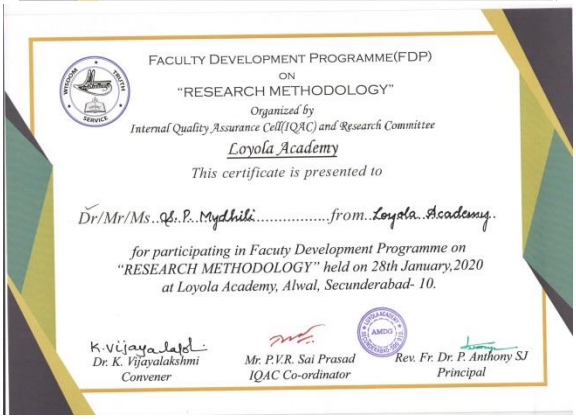
Keywords: metal complexes, pH-metry, stability constant, characterization, antioxidant, antibacterial

1. The faculty attended an FDP programme on "Research Methodology" organized by IQAC and Research Committee on 28th January 2020 at Loyola Academy


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Mr. P.V.R. Sai Prasad
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IQAC Co-ordinator
Rev. Fr. Dr. P. Anthony SJ
Principal



2. The faculty attended an FDP programme on "MOODLE" organized by IQAC at Loyola Academy on 14th and 15th February 2020









3. Dr. Sonika Sharma attendedn Attended a NAtionla Symposium on " Covergence of Chemistry and Materials" on 17-18 Dec, 2019, BITS-Pilani -Hyd campus

4. Dr. Sonika Sharma Participated in NPTEL Workshop conducted on 25 th Jan. 2020 at IIT-Madras



III. Student Achievements

1. Ms. N Paranathi and Ms. K Lavanya of batch 2018-20 were selected for summer project fellowship sponsored by Indian Institute of Madras (IITM), Tamilnadu, India.
2. Ms M. Pavithra and J. Anusha presented a poster in
3. 32 students did summer projects in English/Chemistry from 15th may to 15th June 2019.
4. 22 students presented models, 6 students participated in science Quiz and 1 student gave oral presentation in National Science Day organized by Department of Sciences at Loyola Academy on 28th and 29th February 2020.

IV. <u>Career Placementst</u>

Eight students were placed in diff erent companies like Sai Life Sciences, Daicel Chiral, GVK Bio Sciences, Vimta Labs.