Progress Report of SEED MONEY GRANT

Amount Rs. 1 lakh

Received under

RUSA 2.0

The seed grant assistance for formulation of research proposal under RUSA 2.0 entitled ***"Synthesis, characterization and applications of magnetically separable heterogeneous nanocatalysts and their catalytic potential in organic trasformations"*** cost Rs. 1 lakh has the following outcomes:

1) Seed money grant assistance helped in the purchase of chemicals for the primary research proposal investigation.
2) This grant was further utilized in the preparation of magnetically separable catalysts. Besides these, some other heterogeneous nanocatalysts were prepared and fully characterized by various characterization techniques such as SEM TEM, FTIR, TGA, XPS, XRD, Elemental mapping, Raman, VSM, PL, UV, BET etc.
3) First of all nanoparticles were synthesized by sol-gel, co-precipitation method etc. Prepared nanoparticles were used in the development of magnetically separable heterogeneous nanocatalysts by chemical modification using ionic liquid/amino acid etc.. Catalysts such as Magnetically separable nanocatalyst (IL@CuFe 2 O 4 -L-Tyr-TiO 2 /TiTCIL) ,Hybrid ceria and chitosan supported nickel nanoparticles etc. were prepared.
4) Applications of the developed catalysts were carried out in various organic transformations such as in the synthesis of biologically active heterocycles, reduction, Click reaction etc. Synthesized products were also characterized using 1H NMR, IR and mass spectral studies. Some products were grown into single crystals and studied by Single Crystal X-ray Crystallography. **ORTEP** view was taken. These crystals were further studied by DFT.
5) Another application of the developed catalysts was explored in the removal of water pollutants by photodegradation and adsorption of dye such as photodegradation of methylene blue (MB) etc.
6) Prepared catalysts were found to be recyclable for various consecutive runs what made the process cost-effective and fall in the domain of **Green Chemistry**.

7) Papers are published in International Journal of Repute such as in ***Applied Organometallic Chemistry***, ***Journal of Molecular Structure***, ***Dalton Trans*** **(Accepted)** etc.

8) Seed money grant assistance also helped in preparing a complete research proposal. Objectives and research methodology which I followed during this research proposal helped me in developing a complete research proposal which I have submitted to funding agency (JKDST) and sanctioned project from JKST&IC amounting to Rs. 9.83 lakh in 2021.

10. Very soon I will submit another research proposal to DST SERB (SERB POWER GRANT) which involves some such types of key points as used in primary research investigation.

Thanks,

(10.06.2022)

Dr. Monika Gupta
(Sr. Assistant Prof.)
PG Department of Chemistry,
University of Jammu,
Jammu.