National Institute of Technology Rourkela

Registration Seminar

Seminar Title	: Synthesis of Heterocycle Functionalized Carba-[3]Ferrocenophanes, structural evaluation and their properties study
Speaker	: Madhusri Jana (Rollno : 522cy2011)
Supervisor	: Prof. Saurav Chatterjee
Venue	: Chemistry Seminar Room
Date and Time	: 12 Dec 2024 (10:30 AM)
Abstract	: Ferrocenophanes, or ansa-ferrocenes, are organometallic compounds derived from ferrocene, featuring cyclopentadienyl (Cp) rings bridged by one or more linkers, introducing strain and altering electronic, redox, and steric properties. These modifications make ferrocenophanes versatile in chemical synthesis and applications. Among them, carba-ferrocenophanes are distinguished by carbon-based bridges, which provide enhanced thermal and chemical stability due to robust carbon-carbon bonds. Carba-bridged loop [n]ferrocenophanes where the Cp rings are connected by a looped carbon chain (denoted by n, the number of carbon atoms in the loop) introduce significant strain and unique electronic characteristics. This structural rigidity enhances their potential in diverse applications, including catalysis, medicinal chemistry, and biosensing. Functionalization of carba-bridged ferrocenophanes further diversifies their utility, enabling their use as pharmacophores in cytotoxic drugs, catalysts for organometallic reactions, and redox-active components in polymerization and electronic materials. In biosensing, ferrocenophane derivatives with functionalized heterocyclic bridges, such as thiophene, furan, or pyridine, exhibit enhanced sensitivity and selectivity toward biological analytes. These molecular sensors operate without the need for external devices, allowing for targeted and rapid detection of biomolecules such as proteins and nucleic acids. This growing field of molecular biosensing expands the utility of ferrocenophanes in chemical, environmental, and diagnostic research, underscoring their role as versatile motifs in both fundamental and applied chemistry.