Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad - 500107

Colloquium

Models for Molybdenum and Tungsten Enzyme's Active Sites – Developments in Dithiolene Chemistry

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Molybdenum or tungsten containing enzymes are important components of almost any known organism. Except for nitrogenase they typically catalyse the oxygen atom transfer as a two-electron redox process and are involved in the metabolisms of carbon, nitrogen and sulfur. Molybdopterin is a unique ligand in the active sites of these enzymes binding the metal by its dithiolene moiety.

It was proposed that this ligand actively participates in electron transfer processes. The chemical synthesis of the molybdopterin ligand has proven to be extremely difficult. The possibly nearest model known today was published by Burgmayer and co-workers in 2012 and then investigated further. In order to synthesize model ligands for MPT reliably, with good yield and with an acceptable amount of work, typically compounds bearing the coordinating dithiolene function and various different substituents on the double bond are considered to model MPT sufficiently well. Most known models, however, do not take into account the electronic influence MPT might have. In order to find a balance between do-ability and suitability of model ligands new dithiolenes were developed taking into account several different aspects of the natural molybdopterin. The synthesised ligands and complexes were characterised and investigated for their chemical and electronic structure and their reactivity by various methods (e.g. UV-vis, NMR, Mass, X-ray diffraction, T-dependent electrochemistry).

Friday, Feb 22nd 2019

11:30 AM (Tea/Coffee at 11:00 AM)

Auditorium, TIFR-H