

# GLOBAL E-CONFERENCE ON CHEMISTRY AND CHEMICAL ENGINEERING

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### Glucopyranosylamine derived Mo(VI) complex: self-assembly into coordination polymer and catalyst for selective oxidation of organic sulfides

Pentacoordinate molybdenum or MoO<sub>2</sub>(tridentate).D (D = monodentate ligand) complex tends to form polymeric or dimeric complexes due to the labile sixth coordination site. Previous reports show that polymeric or dimeric MoO<sub>2</sub> complexes generally formed due to self-assembly of discrete units via Mo=O---Mo interaction<sup>1</sup> or by using a bridging<sup>2,3</sup> ligand. Only a few occurrences involve dinuclear complexes<sup>4</sup> all other publications deal with mononuclear complexes.

Bis-(4,6-O-Ethylidene-β-D-glucopyranosylamine)-1,4-dihydroxy-2,5-dibenzylidene (H<sub>6</sub>L) has been reacted with MoO<sub>2</sub>(acac)<sub>2</sub> to afford coordinatively flexible dinuclear octahedral complex (MoO<sub>2</sub>)<sub>2</sub>H<sub>2</sub>L.2D, (D = solvent). Recrystallization of the complex from dimethylformamide (DMF) yielded single crystals of coordination polymer [(MoO<sub>2</sub>)<sub>2</sub>H<sub>2</sub>L.DMF]<sub>n</sub>, where the sixth coordination sites are occupied by Glu-OH<sub>3</sub> and DMF. The solution-state studies reveal the presence of a discrete system while the solid-state studies support the polymeric nature, which was addressed by density functional theory (DFT). To the best of our knowledge, this is the first report on the polymeric metal complex of glucopyranosylamine-derived ligand. The synthesized dinuclear Mo(VI) complex has been used as the catalyst for the selective oxidation of organic sulfides into sulfoxides and sulfones using urea hydrogen peroxide as an oxygen source. Selective oxidation of thiols leads to the formation of disulfides, and all these reactions are specific to the sulfur centers irrespective of the presence of alkene, amine, aldehyde, and ketone groups in the molecule.

**Keywords:** Ditopic-ligand; Single-crystal; Homogeneous catalysis.

### Biography:

I joined BITS Pilani, Pilani Campus in January, 2020 as a research Scholar and working on a research project entitled “Synthesis and application of ditopic ligands and their metal complexes in chemosensing and catalysis.” I am also involved in conducting chemistry laboratory classes with Professors for undergraduate students as a teaching assistant. Right now I am working in the Central HRMS facility and responsible for maintaining the instrument and analyzing the institute samples.