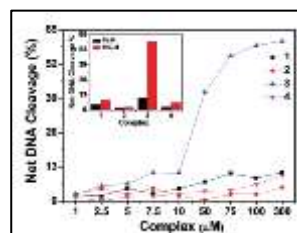
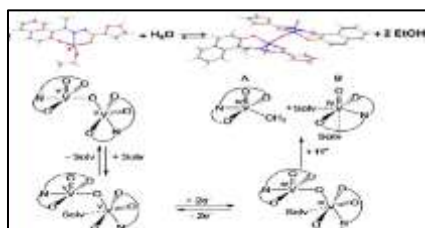


Variable Valence Oxidometal (Mo and V) Complexes of Mono- and Dibasic Ligands: Exploring Solution Behavior and Biological Activities

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Molybdenum and vanadium complexes of various O-N and/or N-S donor scaffolds are appealing candidates in the search for new diagnostic and therapeutic agents. Examples of molybdenum mediated C-C coupling and $\text{C}=\text{N}$ bond cleavage reactions are interesting and sparse in literature. Also, in contrast to the well-known molybdenum(VI/IV) complexes few structural reports are there of monooxido Mo^{IV} complexes, generated through “oxotransfer” processes. On another hand, in comparison to the well-known oxidovanadium(IV)/(V) complexes, relatively few non-oxido V^{IV} complexes, have been isolated and structurally characterized. Interestingly, the solid state chemistry for a particular compound may be different from that in solution. Hence, we have been motivated to focus on our present work¹⁻⁸ which comprises of the synthesis of oxidomolybdenum(VI) complexes procured from Schiff base ligands, bis- μ -imido bridged metal-metal bonded oxidomolybdenum(V) complexes of salens, $\text{Mo}(\text{VI}/\text{IV})$ complexes of thiosemicarbazones, vanadium(IV), oxidoethoxido vanadium(V), dinuclear μ -oxidovanadium(V) and mixed oxidation $\text{V}(\text{IV},\text{V})$ complexes with tridentate aroylazine ligands. DFT calculations were employed for predicting the EPR, V^{51} NMR and UV-Vis spectra and the electronic structure of some of the reported complexes. A μ -oxidodivanadium compound, generated from the corresponding mononuclear complex, was characterized in solution and in the solid state. The mixed oxidation $\text{V}(\text{IV},\text{V})$ species were detected through electro synthesis and characterized by EPR spectroscopy and DFT calculations. The insulin mimetic, cytotoxic activities and DNA interaction properties of the synthesized complexes were also explored and the compounds were found to exhibit significant biological activities.



References:

1. S. P. Dash, R. Dinda et al. *Inorg. Chem.*, **2013**, 52, 14096.
2. S. P. Dash, R. Dinda et al. *Dalton Trans.*, **2014**, 43, 10139.
3. S. P. Dash, R. Dinda et al. *J. Inorg. Biochem.*, **2015**, 144, 1.
4. S. Pasayat, R. Dinda et al. *Eur. J. Inorg. Chem.*, **2016**, 1604.
5. S. P. Dash, R. Dinda et al. *Inorg. Chem.*, **2016**, 55, 1165.
6. S. P. Dash, R. Dinda et al. *Inorg. Chem.*, **2016**, 55, 8407.
7. S. P. Dash, R. Dinda et al. *Dalton Trans.*, **2016**, 45, 18292.
8. S. Roy, R. Dinda et al. *J. Inorg. Biochem.*, **2017**, 172, 110.