

#### **4. CONCLUSION**

A series of mononuclear, dinuclear and polynuclear dioxomolybdenum(VI) complexes containing *-ONO* and *-ONS* hydrazone Schiff base tridentate dianionic and hexadentate tetraanionic ligand system were successfully synthesized. These complexes have been characterized by various spectroscopic means (IR, UV and NMR) and they run in concord with the structures elucidated by X-ray crystallography. The spectroscopic data and X-ray data are consistent with six fold coordination of molybdenum(VI) complexes with the octahedral geometry. The thermal analysis of the complexes indicates that the thermal stability of the molybdenum complexes depends on the packing mode and the intermolecular forces between the molecules. Based on the thermal gravimetric data obtained, it can be suggested that the complexes such as **C18**, **C19** and **C24**, in which the decomposition occurred at 200-280°C, are more stable. In addition, the electrochemical study shows irreversible redox behaviour of all the dioxomolybdenum(VI) complexes synthesized, except for **C13**, **C18** and **C24**.

The catalytic property of these dioxomolybdenum(VI) complexes with respect to the peroxidic oxidation of alcohol has been tested for benzyl-alcohol as substrate. Controlled experiment showed that practically no oxidation occurred without catalyst. In the presence Mo(VI) complexes, benzoic acid was produced after 24 hours of reaction. By varying the reaction temperature, concentration of substrate and the concentration of the complexes as catalyst, it was found that **C13**, **C18** and **C24** gave a relatively high percentage of benzyl

alcohol conversion. Based on the TGA, CV and catalytic property study analysis, **C13**, **C18** and **C24** seem to be suitable catalysts for oxidation of alcohol. However, the catalytic action is preliminary and the result shows these dioxomolybdenum(VI) complexes to be only limitedly active and do not contribute much to catalytic action as no satisfactory conversion was obtained with the increase in the reaction temperature, the concentration of substrate or the amount of catalyst.