

# SE&T Colloquium Series-Winter 2012

Speaker	Dr. Arpita Saha Department of Chemistry
Title	<i>Exploring the Coordination Chemistry of N, N, N', N'-Tetrakis(2-hydroxyethyl) ethylenediamine in Polynuclear Manganese Cluster Chemistry</i>
Abstract	<p>The research talk focuses on the investigation of new synthetic routes towards the preparation and subsequent characterization of novel multinuclear transition metal/lanthanide complexes that can function as molecular nanomagnets, better known as single-molecule magnets (SMMs). The major compelling property of these metal clusters is that they behave like tiny magnets, i.e. they show slow relaxation of magnetization at low temperature. In addition these molecular systems often exhibit quantum properties which make them interesting candidates to use as qubits in quantum computation. In 1993, the first SMM was discovered, [Mn<sub>12</sub>O<sub>12</sub>(O<sub>2</sub>CCH<sub>3</sub>)<sub>16</sub>(H<sub>2</sub>O)<sub>4</sub>], better known as Mn<sub>12</sub>Ac, which was a breakthrough in the field of molecular magnetism. In the subsequent years, there has been massive amount of research in this area, and the SMM database has greatly expanded as research groups around the world have made new ones. The synthesis of such polynuclear metal clusters involves the incorporation of multiple metal atoms supported by organic ligands. In this regard, alkoxide-based ligands play a pivotal role since this functionally is an excellent bridging group that fosters higher nuclearity product formation. Such polydentate ligands have led to the discovery of many interesting 3d clusters, some of which display SMM behavior.</p> <p>The research talk will be on the investigation of new synthetic methods, combining an alkoxide-based ligand with various carboxylates and azides. In this regard, potentially hexadentate (O,O,O,O,N,N) N,N,N',N'-tetrakis(2-hydroxyethyl) ethylenediamine (edteH<sub>4</sub>) ligand has been used. Herein, the synthesis, structure, magnetic and electrochemical properties of various nuclearity Mn<sub>x</sub> clusters, where x = 3, 4, 6, 9, 10, 12, 18, 20, will be discussed.</p>
Date	Tuesday, March 27
Time	4:10-5:00pm
Place	Pioneer 240
	Refreshments will be served at 4:00pm.