School of Chemistry

Aims and Objectives: Session 2023-2024, Semester 2

Module CH5517: Advanced Physical Inorganic Chemistry

Course Title: Paramagnetic Inorganic Molecules

Duration: 20 hours

Lecturer: Dr B. E. Bode

Aims: To provide an overview of inorganic 'open shell' compounds including synthesis, characterisation and applications of paramagnetic inorganic species. To survey basic and advanced electron paramagnetic resonance experiments useful for characterisation, determination of molecular and electronic structure and the study of structural dynamics of paramagnetic molecules. To appreciate the importance of these species in homogeneous catalysis, bioinorganic chemistry and biophysics.

Objectives:

1. To appreciate the challenges in generating, stabilising and characterising paramagnetic compounds.

2. To understand the significance of paramagnetic species and intermediates in (bio)inorganic main group and d-block chemistry and in catalysis.

3. To discuss the utility of continuous wave electron paramagnetic resonance for investigating 'open shell' species in (bio)inorganic chemistry and catalysis.

4. To survey advanced pulse electron paramagnetic resonance techniques and to understand the relevance of resolving small electron-nuclear and electron-electron spin-spin interactions.

5. To showcase the importance of investigating paramagnetic inorganic molecules with a number of case studies from homogeneous catalysis, bioinorganic chemistry and biophysics.