

School of Chemistry

Aims and Objectives: Session 2022-2023

Module CH3521: Inorganic Chemistry Laboratory

Duration: 150 hours (10 weeks in semester 2, 2 sessions per week, plus self-study time)

Staff: Dr B. A. Chalmers*, Dr P. Kilian and Dr A. Stasch
(*Co-ordinator)

Aims: **Teaching of practical Inorganic Chemistry.** To provide illustrative experiments to support the material taught in the Honours courses and to give the students practical experience in modern techniques used in the synthesis, isolation, characterisation and structure determination of inorganic compounds and materials. To know the process of selecting and adopting a synthetic route to a known compound using search in electronic databases and in primary literature. To be able to communicate results in different ways including writing a comprehensive report of the work in a scientific format, and oral examination.
Health and Safety. To train students to assess fully the hazard ratings of chemicals to be used and the risks associated with the manipulations and procedures contained within each experiment.

Objectives:

1. Carry out experiments and understand the theory behind the experiment.
2. Identify and understand the potential hazards in the core experiments using supplied Hazard Ratings for experimental materials and Risk Assessment forms.
3. To produce a Risk Assessment for a chosen procedure, carry out this procedure, and reflect upon your decisions in the final assessment.
4. Perform the experiments carefully with due attention to accuracy, good procedure and health and safety. Obtain the required product, accounting if necessary for any losses which occur.
5. Purify the product by an appropriate method and determine its m.p. or b.p. where required.
6. Characterise the products using appropriate physical and spectroscopic techniques as indicated for each experiment. Obtain UV-Vis, IR and cyclic voltammetry yourself and prepare a sample for ^1H , ^{31}P and ^{13}C NMR spectroscopy.. Fully interpret the data from these techniques as well as that from 2D NMR spectroscopy, mass spectrometry and powder X-ray diffraction, which will be provided. Present the data in a systematic way, accounting in detail for each signal and commenting on how the data supports the expected structure of the product, the presence, amount and identity of any impurities.
7. Deduce information about an unknown compound based upon analytical, spectroscopic and other data gathered.
8. Write a detailed report for a given experiment following the guidelines provided on Moodle.,
9. Orally present your results to an academic staff in a clear, succinct way.