

General safety related description of research work and procedures in the laboratories of Prof. Marcel Schlaf at the University of Guelph

Location of Laboratories:

MacNaughton Building

Room MACN 240 (synthetic lab – HIGH HAZARD AREA)

MACN 347 (analytical lab – LOW HAZARD AREA)

MACN 309 (high-pressure hydrogenation – HIGH HAZARD AREA)

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Nature of the research:

The research deals with the transformation of alcohols, polyols and sugars using transition metal based methodology.

Types of procedures involved:

Typical reaction set-ups involve the heating and stirring of (complex) mixtures of various chemicals and organic solvents in glass apparatus, often under reflux conditions with continuous water cooling and under inert gas atmosphere or vacuum on a scale of 10 to 1000 mL total volume. Typical maximum heating temperatures are below 200 °C. Occasionally reactions will be carried out in 50 to 500 mL stainless steel autoclaves at elevated temperatures and pressures up to 2000 psi using various inert, toxic and/or flammable gases.

The synthetic laboratory also contains an inert gas dry-box.

The analytical laboratory contains a GC and a GC-MS both of which handle only minute quantities of liquid samples, as well as an HPLC that handles solvent flow between 1 and 100 mL/min.

NO RADIOACTIVE MATERIALS ARE PRESENT IN EITHER LABORATORY.

Types of chemical involved:

- An extremely wide and always changing variety of organic solids and liquids covering a broad range of reactivity, acidity/basicity and toxicity, where the exact nature of the latter is often unknown.
- A wide variety of flammable and/or toxic organic solvents including but not limited to: ether, alcohols, toluene, hexane, methylenechloride, dimethylformamide, etc.
- An extremely wide and always changing variety of inorganic solids and salts of generally low reactivity, e.g. sodium sulfate (a drying agent) or silica gel.
- Air- and water-reactive materials, some of pyrophoric nature (e.g. butyl lithium) at in quantities/volumes of up to 100 g/1000 mL.
- A wide variety of compressed gases including but not limited to: Air, oxygen, hydrogen, argon, carbon monoxide, hydrogen chloride, hydrogen sulfide.

Typical number of large gas cylinders in MACN 240:

Argon (8), Oxygen (1), Hydrogen (1), Carbon monoxide (1), Nitrogen/Hydrogen mixture (1)

Typical number of gas cylinders in MACN 347:

Helium (2), Medical Air (1), Hydrogen (1)