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## Supplemental Safety Checklist for the Lewis Group

Revised June 2012

### I. Hydrofluoric Acid

I understand the potential dangers associated with hydrofluoric acid (HF). I understand that this substance, from both dilute and concentrated solutions, is conducted easily through my skin and flesh, and can drastically affect calcium levels in my blood. Exposure can result in depletion of calcium in the body (hypocalcemia), which is potentially fatal. Exposure is not limited to skin contact, but can be equally damaging upon inhalation and eye contact. I understand that this can occur by chronic exposure at low levels or by acute exposure. I understand that dilute solutions of HF have an anesthetic effect, so I may not be aware that I have been exposed. I understand that since HF is a weak acid, buffered HF and ammonium fluoride reagents pose similar hazards. I understand that the recommended precaution against exposure is to wear heavy gloves or two pairs of disposable gloves when working with this reagent and to use the reagent in a hood. I understand that if exposed, I must wash the affected area thoroughly with water, apply calcium gluconate ointment, and go to the emergency room. I will use these reagents only after training with a senior member of the group.

sign \_\_\_\_\_ date \_\_\_\_\_

### II. Hydrogen Peroxide + Sulfuric Acid/Hydrochloric Acid + Nitric Acid

I understand that mixtures of concentrated sulfuric acid and hydrogen peroxide are potentially explosive, especially when heated. I understand that their explosive decomposition is catalyzed by the presence of certain metal ions e.g. Silver and by organic compounds in trace amounts. As such, I will only use clean glassware as a container for these mixtures as dirty glassware may contain the aforementioned contaminants. I understand that mixtures of concentrated nitric acid and concentrated hydrochloric acid are also potentially explosive and will emit toxic gasses as they decompose. I will prepare and use these mixtures only after consulting with senior members of the research group. I understand that these mixtures and their components must be labeled at all times. I will not tightly cap any waste bottles containing recently disposed mixtures as their continued decomposition poses an explosion hazard. Under no circumstances will I mix concentrated sulfuric acid with concentrated hydrochloric acid as this will evolve hot hydrochloric acid vapors and cause boiling and splattering of concentrated acid.

sign \_\_\_\_\_ date \_\_\_\_\_

### III. Gallium/Indium

I understand that the metals gallium and indium, as well as their alloy, are toxic, and as such all exposure should be avoided. I understand that the recommended precaution against exposure is to wear safety goggles and disposable gloves when working with these materials and to change gloves often to avoid inadvertent gallium indium contamination.

sign \_\_\_\_\_ date \_\_\_\_\_

### IV. Hydrogen Gas

I understand that hydrogen is highly explosive in mixtures of 4%-74% hydrogen by volume with air. I understand that hydrogen cylinders are not to be stored within 20 ft of any oxygen cylinders. I will ensure that there are no nearby sources of hydrogen when I work with an open flame or any other ignition source. I will shut off the hydrogen tank at the main valve whenever hydrogen is not in use to prevent leaks, which may lead to a fire or explosion hazard.

sign \_\_\_\_\_ date \_\_\_\_\_

### V. Glassblowing

I understand that working with glass is dangerous and the recommended protection is to wear steel woven gloves to protect against cuts due to carelessly broken glass. I understand that the proper way to break glass is to first score along the intended break point and then to apply even pressure to achieve a clean break. I will wear tinted glasses or goggles when working with glass at or near its melting point to avoid exposure to harmful UV radiation. I understand that application of heat to glass can result in sudden breakage and will wear a lab coat and goggles whenever applying heat to glass. I will not attempt any glassblowing operations until properly trained by a Lewis group member.

sign \_\_\_\_\_ date \_\_\_\_\_

### VI. Phosphine Gas

I understand that phosphine is highly toxic at ppm levels and I am aware of the precautions taken by the Lewis Group. I acknowledge that the short term exposure limit (STEL) is 1 ppm and immediately dangerous to life or health (IDLH) level is 50 ppm. I will not in any way alter the phosphine cylinder unless explicitly directed to by the Si CVD head user. I understand that if the phosphine alarm is triggered, I must evacuate Noyes 217, close the door, and alert others on the floor.

sign \_\_\_\_\_ date \_\_\_\_\_