

(9) Safety



Safety shower, eye wash, and other safety apparatus in SNF



Lab user wearing protective gear while handling hazardous chemicals



Chemical spill clean-up station and other safety equipment

Nanofabrication involves the use of many potentially hazardous materials, including corrosive and toxic liquid chemicals and flammable and toxic gases. However, there are many controls and procedures present, and these preventive measures have resulted in an outstanding safety record.

Several hazardous gases are utilized in this facility, including silane (flammable/pyrophoric), ammonia (corrosive), hydrogen (explosive) and phosphine (highly toxic/poisonous). **Liquid chemicals commonly used in nanofabrication also pose a risk.** Examples include: sulfuric acid (corrosive acid), hydrogen peroxide (oxidizer), potassium hydroxide (corrosive base), and acetone (flammable solvent). Particularly insidious is hydrogen fluoride, which can cause deep tissue damage but is not immediately painful when in contact with skin.

While many hazards are present, numerous procedures and controls are present to prevent accidents. Gas detection systems are in place which include remote sensors and interlocks that automatically turn off the gas valves and activate alarms. Fire alarms and toxic gas alarms warn by light and sound, as well as notify response teams. A seismic switch automatically shuts down all gases in the event of an earthquake. Protective gear is required when handling chemicals (the “bunny suits” only protect the wafers from contamination - not the people from hazards). Safety showers and eyewashes are located throughout the lab, and there is a chemical spill clean-up station. Most importantly, lab users are required to take comprehensive safety and equipment training classes where they learn the required procedures. Safety to the environment is also important, and several chemical waste disposal systems are in place to safely treat all liquid and gaseous waste before it leaves the building.