**FACT SHEET ON REACTIVE CHEMICALS**

Laboratory workers must be trained to recognize those chemicals which they may come across which are potentially reactive or explosive. Reactive chemicals are defined as those substances which can, in contact with air, water or other common substances, vigorously or violently give off heat, energy or toxic gases or vapors.

Many pure substances (i.e. uninhibited) can undergo vigorous polymerization quite easily by themselves when they are heated slightly or exposed to light. These include acrylic acid, acrylonitrile, hydrocyanic acid, acrylates , and vinyl acetate.

Some substances are chemically very unstable. Depending on the material, they can react vigorously and, in some cases, explosively under conditions of mechanical shock or even slightly elevated temperature or pressure. Materials in this category include ammonium perchlorate, azides, organic peroxides, dry picric acid, picrate salts, crystalized perchloric acid and triazines.

Reactive chemicals are classified as explosives, strong oxidizing agents, water reactives, air reactives, and special organic compounds.

**Explosives:** Explosives are substances that can detonate or decompose rapidly and violently at room temperatures and pressure with an essentially instantaneous release of large quantities of gases and heat. Gentle heat, light, mild shock, and chemical action can initiate these explosive reactions. Many of these compounds become more sensitive as they age or dry out. Examples include peroxides, nitroglycerin, and TNT.

**Strong oxidizing agents:** Many strong oxidizing agents are capable of detonation or explosive decomposition under conditions of strong heat, confinement, or a strong shock. Violent reactions can occur when strong oxidizers are mixed with combustibles such as wood or paper. Strong oxidizing agents that can cause explosions include perchlorates, inorganic nitrates, chlorates, chromates and the halogens. Strong oxidizing agents will also react violently with most organic compounds, powdered metals, sulphur, phosphorus, boron, silicon, and carbon.

**Water reactives:** Chemicals that combine with water or moisture in the air to produce heat, flammable, explosive or toxic gases are termed water reactive chemicals. These chemicals present a severe fire hazard because sufficient heat is often released to self-ignite the chemical or ignite nearby combustibles. In addition, contact with the skin can cause severe thermal and alkali burns. Common examples include strong acids and bases, alkali metals such as sodium and potassium, hydrides, and carbides. Please see the fact sheet on water reactive chemicals for additional information.

**Air reactives:** Air reactives (also called pyrophoric materials) ignite spontaneously in air at temperatures below 130 degrees F. Finely divided metal powders that do not have a protective oxide coat may ignite when a specific surface area is exceeded. The degree of reaction depends on the size of the particle, its distribution, and surface area. Examples include white phosphorus, alkali metals (potassium, sodium, cesium), nickel, zinc and titanium dusts, hydrides (barium, diborane, diisobutyl aluminum hydride)

**Special Organic Compounds: Peroxide-Forming Chemicals:** A chemical that, when exposed to air, forms explosive peroxides that are shock sensitive, pressure sensitive, or heat sensitive. Please see the fact sheet on peroxide-forming chemicals for additional information.