

CLOSE ENCOUNTERS OF THE LAB KIND

THE SANTAYANA REPORT

George Santayana was a Spanish-American philosopher, essayist, poet, and novelist. In 1905, he penned the famous aphorism “those who cannot remember the past are condemned to repeat it.” More than a century later, the saying reverberates with professionals the world over. The following is a summary of a recent incident at Columbia University. The information presented is intended to provide awareness and help readers plan against the occurrence of a similar situation in their laboratory or work area.

All Labware is Not Created Equal

Five laboratory incidents resulting from chemicals stored within chemically incompatible containers were reported to EH&S in the previous two years, all of which resulted in inadvertent hazardous materials releases. Glass, metal, and plastic containers are all useful for chemical storage under the right circumstances but they cannot always be utilized interchangeably. Each material possesses different chemical resistance characteristics. If a container that is chemically incompatible with the contents is selected, the container can degrade to the point of failure, potentially resulting in a hazardous materials release. For this reason, selecting a container for chemical storage must be done with great care.

In three recent incidents a concentrated potassium hydroxide solution degraded a polyethylene terephthalate (PETG) container. In a fourth, a dichloromethane solution quickly dissolved a polystyrene (PS) container. In another incident a 20 liter steel drum was repurposed as a hazardous waste container. The drum was primarily used to collect organic solvents, but some acidic material was inadvertently collected, causing the drum to corrode and leak. A final incident resulted in the unintended release of osmium tetroxide which was stored in an incompatible container.

How can you select the best chemical storage container? Selecting a chemically compatible container is made easiest by referencing chemical resistance and compatibility guides published on container manufacturer websites. Container manufacturers expose their products to a variety of chemicals under typical experimental conditions (e.g., at room and elevated temperatures) in order to observe changes in visual appearance, mass, and by applying tensile and impact stresses to the materials after exposure.

Lessons Learned

- Always refer to chemical resistance and compatibility guides published on container manufacturer websites before transferring a hazardous material to something other than its original container. An example can be found on the EH&S [website](#), but the specific manufacturer’s information should always be consulted when it is available.
- For more detailed information on labware chemical resistance, please see the Spring 2014 edition of the [EH&S SafetyMatters Newsletter](#).

For further information on this or any other safety related matter, please contact the [EH&S office](#).