

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.

An Imperfect Match

Two recent chemical storage incidents exemplify how improperly stored chemicals can pose a health and safety hazard, result in property or equipment damage, and become an inconvenience to research activities. In the first incident, a metal storage cabinet was used to house corrosive materials, including a commercial product containing nitric acid. Over time the container, inadvertently stored on its side, became brittle and began to leak through the cap, resulting in acid vapor corroding the locking mechanism (right) to the point where the cabinet could not be opened. The condition was discovered when a researcher attempted to open the cabinet, and after coordination with Environmental Health & Safety and a locksmith from Facilities, the cabinet was carefully opened and the leaking contents were discovered and safely discarded. The cabinet, however, was a bit worse for wear and needed to be discarded.



In a separate incident the contents of a chemical storage cabinet (left) became repeatedly covered in a fine white powder, suspected to be an ammonium salt, after a bottle of hydrochloric acid was inadvertently left open near a bottle of ammonium hydroxide. Upon noticing the condition for the first time the laboratory took care to wipe the cabinet clean of the salt formations, but the condition recurred. After consultation with EH&S, it was determined that while the cap to a bottle of hydrochloric acid appeared closed by visual inspection, it was

not properly seated on the threads on the neck of the bottle and remained open. This condition allowed acid vapor to escape into the cabinet, resulting in the continued salt formations. The salt formations can be irritating to the respiratory system when disturbed and are a nuisance to clean up.

Lessons Learned

- o EH&S is always available to consult and assist with chemical storage issues, including providing guidance on safely storing hazardous chemicals. Both laboratories engaged EH&S after noticing an issue, and both issues were resolved in short order by working together to identify the causes and implement corrective actions.

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- o While inadvertent chemical reactions between stored chemicals are not uncommon, they are typically 100% preventable by employing good chemical hygiene principles. This includes ensuring incompatible materials are stored separately from one another, ensuring containers are always tightly sealed, and ensuring that chemical residues are promptly cleaned off of the outside of chemical containers or off of the surface they are stored on.
- o Inadvertent chemical reactions are not just limited to occurring between two or more chemical containers, but can also take place between a chemical and cabinet or other storage surfaces. In the first incident, a metal cabinet, which is susceptible to acid corrosion, was used to store corrosive materials, including a strong acid. When the acid leaked, vapor released into the cabinet caused the metal to corrode and caused permanent damage to the cabinet. For this reason, plastic should always be chosen when selecting a cabinet or storage surfaces for corrosive materials.

For further information, or to view previous Santayana Reports, please visit our [lessons learned website](#).
For any other safety related matter, please contact the [EH&S office](#).