

SAFETY MEMO

March 22nd, 2021 – Chemical Incompatibility



Did you know?

Introduction

Everyone knows that chemicals can be dangerous, but some chemicals are more dangerous in combination with other chemicals. Even relatively safe chemicals can become dangerous when combined with other chemicals that are incompatible.

Examples of Chemical Incompatibilities

Acids and Bases neutralize each other. This reaction often produces gases. The gases themselves can be dangerous and may also cause splashing of the dangerous liquid.

Flammables and Oxidizers may cause spontaneous or more virulent fires, even with no obvious ignition source.

Even **Water** can be dangerous in combination with other chemicals. Strong acids mixed into water will generate a significant amount of heat. Some metals and metal salts may form toxic or dangerous substances when mixed into water.

Chemical Safety at Home

You may have heard that mixing household products can be dangerous. Bleach, especially, can form several different dangerous substances when mixed with other household cleaners. Chloramine gas is formed when mixing with ammonia. Chlorine gas is formed when mixing with acids (such as vinegar). It is best not to mix any household cleaners. Many contain chemicals with similar incompatibilities.

Bleach is often sold in concentrated form, so it requires another bottle to create a dilute mixture for cleaning. Mix only as much as you need and make sure the excess is disposed of after you are done cleaning to prevent inadvertent mixtures. Avoid storing cleaner in unmarked containers, and never use an empty container of one household cleaner to store another household cleaner. Even if the container is rinsed it may contain residues.

Although home chemicals do not have safety data sheets, some warning information is contained on the label, and some cleaners have a phone number you can call to learn more.



Figure 1: Even household chemicals can be dangerous when mixed. (Photo by cameronconner under [CC BY-NC-SA 2.0](#) license)

Recommendations

Know the risks. All workers potentially handling or being exposed to chemicals should receive training on WHMIS (Workplace Hazardous Material Information System). Part of this program is where to find information about chemical incompatibilities on the Safety Data Sheet (SDS). Section 7 (Handling and Storage) of the SDS will contain information on the safe handling practices and conditions. Workers should also know where to find the SDS for their workplace.

Know the requirements. Acids and bases, for example, must be stored in separate cabinets or in separate compartments of the same cabinet (with separate secondary containment, each designed to hold 25% of the total stored liquid volume in that compartment). Refer to section 7 of the SDS and to the relevant codes to determine storage requirements.

Stay vigilant. Remember that engineering controls only protect you if they are well-designed and in good working order. Use proper storage cabinets that are appropriate to the chemicals being stored (e.g., corrosion resistant) and monitor them to ensure they keep incompatible chemicals away from each other.

Do not mix incompatible chemicals. Although this may seem simple, workers must be aware of the potential hazards from mixing chemicals. It is also essential to have safe work procedures for storing and handling chemicals and for cleaning equipment to prevent inadvertent contact between incompatible chemicals.

