"Safety Comes First"

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Environmental Health and Safety

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June/July 2020

In this issue:

The Inadvertently Disruptive Sounds Your Coworkers Find Annoying

Eighty percent of workers polled for the Sony Sound Report encounter unwanted noise in the workplace, reports Sophie Haslett in the *Daily Mail Australia*. Of course, Sony sells noise-canceling headphones, so the results are perhaps welcome news to it, but the rest of us can make use of the report's findings, too. By knowing which sounds are most likely to irritate your coworkers, and avoiding them, you can help improve work relationships, morale, and even productivity. According to the report, the most annoying office sounds include:

- Telephones ringing and not being answered
- Colleagues who talk and laugh loudly
- Colleagues sneezing, sniffing, or coughing
- Nearby construction
- People who use their phone on speaker
- People who have keyboard sounds on their phone
- Door slammers
- Loud eaters
- Obnoxiously loud, "shrieky" laughter in communal areas
- People who say "Happy Friday"
- People who click a ballpoint pen or tap their false nails on their desk

If you recognize yourself in any of these, think about curbing the offending noise. Your coworkers will appreciate it.

Source: Safety.BLR

Polymer Radiation Shield May Replace Lead

'Traditional radiation shielding materials, like lead, are often expensive, heavy, and toxic to human health and the environment...'

A material consisting of a polymer compound embedded with bismuth trioxide particles holds tremendous potential for replacing conventional radiation shielding materials, such as lead, a new study shows.
The bismuth trioxide compound is lightweight, effective at shielding against ionizing radiation such as gamma rays, and can be manufactured quickly. Those qualities make it a promising material for use in applications such as space exploration, medical imaging, and radiation therapy.

"Traditional radiation shielding materials, like lead, are often expensive, heavy, and toxic to human health and the environment," says corresponding author Ge Yang, an assistant professor of nuclear engineering at North Carolina State University.

"This proof-of-concept study shows that a bismuth trioxide compound could serve as effective radiation shielding, while mitigating the drawbacks associated with traditional shielding materials."

Researchers demonstrated that they could create the compound using a curing method that relies on ultraviolet (UV) light—rather than relying on time-consuming high-temperature techniques.

"Using the UV curing method, we were able to create the compound on the order of minutes at room temperature—which holds potential for the rapid manufacturing of radiation shielding materials," Yang says.
"This is an important point because thermal polymerization, a frequently used method for making polymer compounds, often relies on high temperatures and can take hours or even days to complete. The UV curing method is both faster and less expensive."

Using the UV curing method, the researchers created samples of the polymer compound that include as much as 44% bismuth trioxide by weight. The researchers then tested the samples to determine the material's mechanical properties and whether it could effectively shield against ionizing radiation.

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Polymer Radiation Shield , cont.

(Continued from page 2)

"This is foundational work," Yang says. "We have determined that the compound is effective at shielding gamma rays, is lightweight, and is strong. We are working to further optimize this technique to get the best performance from the material.

"We are excited about finding a novel radiation shielding material that works this well, is this light, and can be manufactured this quickly." The paper appears in the journal *Nuclear Engineering and Technology*.

"This proof-of-concept study shows that a bismuth trioxide compound could serve as effective radiation shielding, while mitigating the drawbacks associated with traditional shielding materials," says Ge Yang. (Credit: Judy and Ed/Flickr)

Source: NC State

'This proof-of-concept study shows that a bismuth trioxide compound could serve as effective radiation shield-ing...'

The Safety Data Sheet (SDS) and Chemical Storage

"Always be sure the chemical is compatible with the other chemicals in the storage area or cabinet..."

SDSs are composed of 16 sections, and these sections will always appear in the same order for any product, regardless of who manufactures it. Section 7, titled Handling and Storage, provides three types of information: precautions for use, general hygiene practices, and recommendations for conditions of storage.

Precautions for you to take when using the chemical may include recommendations such as:

- "Do not breathe vapors or dust."
- "Avoid contact with skin and eyes."
- "Keep away from open flame, hot surfaces, or sources of ignition."
- "Use only nonsparking tools."

"Ensure adequate ventilation," or maybe something more specific, such as, "Only open the container under a ventilation hood."
It may also provide recommendations for minimizing the accumulation of an electrostatic charge that could possibly ignite the chemical.

General hygiene information typically addresses actions such as avoiding eating, drinking, and smoking in the work area and washing hands after handling the chemical.

Recommendations for storage of the chemical may specify ventilation requirements, storage conditions such as the temperature and humidity of the storage area, proximity to heat, and incompatible materials. Always be sure the chemical is compatible with the other chemicals in the storage area or cabinet, meaning you should store chemicals with other chemicals with similar hazards. Storing chemicals with incompatible chemicals can result in spills, dangerous reactions, fire, and even explosions.

Source: Safety BLR

Metalworking Fluids

Metalworking fluids are used during the machining and grinding of metal parts to prolong the life of the tool, carry away metal chips and other machining debris, and protect the surface of the work piece. The four major classes of metalworking fluids are straight oil, soluble oil, semisynthetic, and synthetic.

You can be exposed to metalworking fluids by breathing in the mist or getting fluids on your skin while performing a machining task. Exposure is hazardous and can cause serious health issues, including respiratory diseases such as asthma, chronic bronchitis, and impaired lung function, as well as skin disorders like eczema and acne. It's important to read the fluid's safety data sheet (SDS) before working with the metalworking fluid so you are aware of the health hazards to which you may be exposed.

Some ways you can control your exposure to metalworking fluids include:

- Using good personal hygiene practices.
- Applying barrier and moisturizing creams.
- Keeping your workspace free of clutter.
- Periodically inspecting and maintaining the process and control equipment.
- Following the proper procedures to perform the task.
- Wearing the appropriate personal protective equipment (PPE) needed for a task, such as gloves, protective sleeves, aprons, trousers, caps, safety goggles, safety glasses, and/or respirators.
- Familiarizing yourself with the metalworking fluids management program, which contains the information for who is responsible for performance of the system; who is responsible for adding materials; a written standard operating procedure (SOP) for testing the fluid; and a data collection and tracking system.

Source: Safety BLR

"Familiarize yourself with the metalworking fluids management program..."

Hazard Communication (SDS)

"It (SDS) can provide important information to help deal with the release and possibly prevent injury or damage to the facility...."

The SDS and exposure control

The safety data sheet (SDS) is composed of 16 sections, and these sections will always appear in the same order for any product, regardless of who manufactures a particular chemical. Section 8, titled Exposure Control and Personal Protection, provides information on exposure limits, recommendations on engineering controls, and personal protective equipment (PPE) to limit exposure.

If a hazardous chemical is accidentally released or spilled and there is uncertainty about what to do, find the SDS for that chemical. It can provide important information to help deal with the release and possibly prevent injury or damage to the facility.

Section 8 of the SDS provides the following information:

- **Exposure limits,** such as permissible exposure limits (PELs), established by the Occupational Safety and Health Administration (OSHA) and any other exposure limits recommended by the manufacturer. Your employer may conduct monitoring and perform calculations to determine if airborne concentrations of the chemical are reasonably expected to approach or exceed these exposure limits. If so, additional monitoring will be conducted, and specific controls and PPE will be required.
- **Engineering controls** to limit potential exposure, including recommendations for appropriate ventilation, if the process should be fully enclosed, or limits on the amount of time a worker is exposed to the hazardous chemical.
- **PPE** may include specific types of eye protection; appropriate clothing to protect your skin; and, when necessary, appropriate types of respiratory protection.

The SDS is composed of 16 sections, and these sections will always appear in the same order for any product, regardless of who manufactures a particular chemical.

Section 1: Chemical identification includes the product identifier; manufacturer name, address, and phone number; an emergency phone number; and recommended use and restrictions on use.

Section 2: Hazard(s) identification discusses all the chemical's hazards and required label elements.

(Continued on page 7)

Hazard Communication (SDS), Cont.

(Continued from page 6)

Section 3: Composition/information on ingredients lists the chemical's ingredients.

Section 4: First-aid measures tells you what to do if there is an exposure to this chemical in your workplace.

Section 5: Firefighting measures discusses the proper fire extinguishers to use.

Section 6: Accidental release measures lists emergency procedures, protective equipment, and proper methods of containment and cleanup.

Section 7: Handling and storage discusses how to safely handle and store the chemical.

Section 8: Exposure control and personal protective equipment (PPE) lists permissible exposure limit (PEL) information, threshold limit value (TLV) information, appropriate engineering controls, and PPE required to handle the chemical.

Section 9: Physical and chemical properties tells you the chemical characteristics of the product.

Section 10: Stability and reactivity describes the reactivity hazards of the chemical and the chemical stability information.

Section 11: Toxicological information discusses exposure routes, symptoms of exposure, acute and chronic effects, and the numerical measures of toxicity.

Section 12: Ecological information tells you how the product may harm the environment.

Section 13: Disposal consideration discusses how to properly dispose of the product.

Section 14: Transport information discusses how to safely transport the product.

Section 15: Regulatory information tells you what laws and regulations for use of this chemical may apply.

Section 16: Other information includes the date of the product preparation and the last revision date of the SDS or chemical.

"Handling and storage discusses how to safely handle and store the chemical."

Eye and Face Protection from Chemical Splashes

When handling hazardous chemicals, it's important to use the appropriate eye protection to prevent injuries from splashes or irritating mists. Most eye and face injuries happen because workers are not wearing protection.

The following are examples of protection devices:

- Goggles with indirect ventilation
- A face shield to be worn over spectacles or goggles
- A full-facepiece respirator

Before putting on your protective device, ensure that it has a "D3" marking, which indicates the appropriate splash rating, along with the manufacturer mark on it. It may also have a "+" sign to show it is impact-rated.

The following are two worst-case scenario do's and don'ts of a chemical accident occurring while not wearing a protection device:

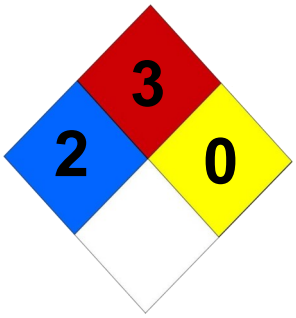
- A hazardous chemical splashes into your eyes. ***Do*** flush them with water immediately while forcing the eyelids open. Continue flushing for at least 15 minutes. If you are wearing contact lenses, take them out while you are flushing. ***Don't*** delay the flushing to take out your lenses, but make sure that you take them out. Seek emergency medical help quickly.
- A chemical mixture is heated for a desired reaction, but it results in an explosion that sends glass flying into your left eye. ***Don't*** rub the eye! Carefully try to flush it out with a gentle stream of clean, warm water. Use an eyecup or a small drinking glass positioned with its rim resting on the bone at the base of your eye socket. If you're wearing contact lenses, remove them before or while you flush with water.

Source: Safety BLR

"...remove them (contact lenses) before or while you flush (your eyes) with water."

Chemical Spotlight: Acetonitrile

Acetonitrile is a colorless liquid with an ether-like odor and a sweet, burnt taste. It easily dissolves in water and is also known as cyanomethane, ethyl nitrile, ethanenitrile, methanecarbonitrile, acetronitrile cluster, and methyl cyanide.



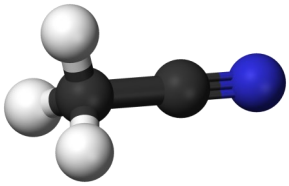
There is a wide range of uses for acetonitrile, including pharmaceuticals, perfumes, and acrylic nail removers, as well as rubber products, pesticides, and batteries. It is also used to extract fatty acids from animal and vegetable oils.

Store acetonitrile in a locked, secure location that is well ventilated and cool. Acetonitrile may react with water, moisture, and steam to form toxic vapors. Take precautionary measures against static discharges, ground and bond all equipment containing the material, and avoid all possible sources of ignition. Store acetonitrile away from oxidizing agents, strong acids and bases, reducing agents, and alkali metals.

"Acetonitrile may react with water, moisture, and steam to form toxic vapors..."

If acetonitrile is spilled, avoid breathing vapors, mist, or gas, and ensure adequate ventilation. Remove all sources of ignition, and evacuate personnel to safe areas. Use personal protective equipment (PPE), including goggles or safety glasses, gloves, flame-retardant protective clothing, and respiratory protection.

Prevent further leakage or spillage if safe to do so, and do not let the product enter drains, sewers, underground or confined spaces, groundwater, or waterways or discharge into the environment. Contain the spillage, and collect it with noncombustible absorbent material such as sand, soil, diatomaceous earth, or vermiculite. Place the spillage in a container for disposal according to federal and local regulations.

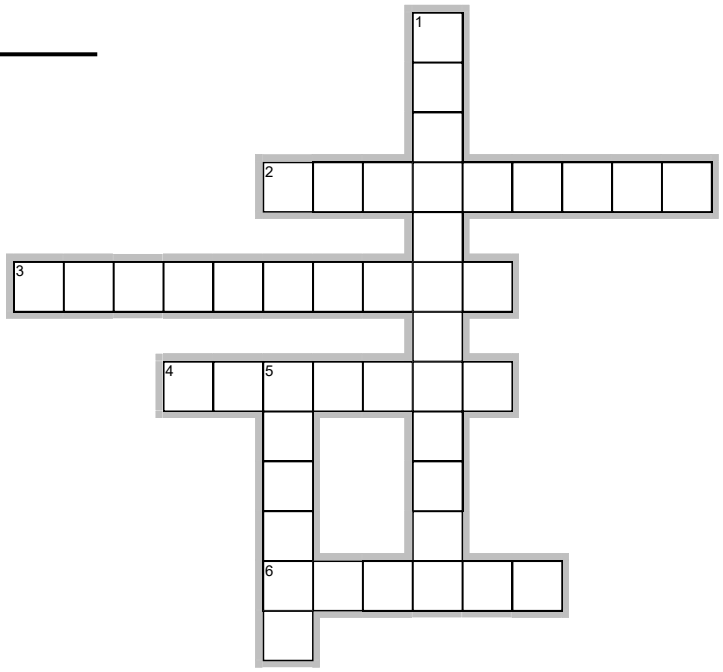


Fun Page

FUN PAGE

Across

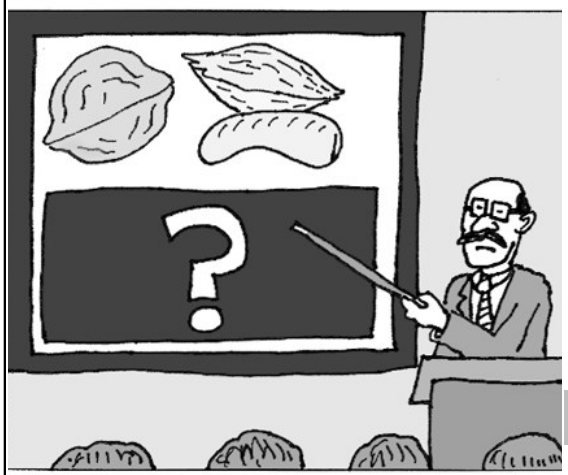
2. The four major classes of metalworking fluids are straight oil, soluble oil, semisynthetic, and _____.
3. Storing chemicals with incompatible chemicals can result in spills, dangerous reactions, fire, and even _____.
4. This proof-of-concept study shows that a _____ trioxide compound could serve as effective radiation shielding,
6. If a hazardous chemical is accidentally released or spilled and there is uncertainty about what to do, find the _____ Data Sheet for that chemical.



Down

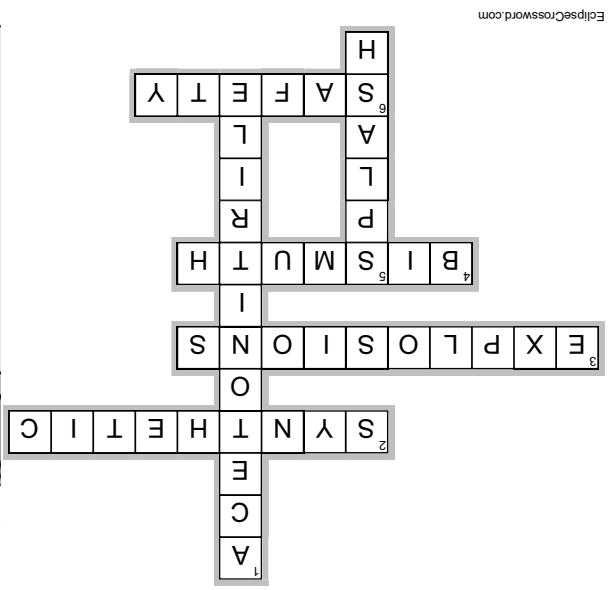
1. _____ is a colorless liquid with an ether-like odor and a sweet, burnt taste.
5. A "D3" marking on goggles indicates _____ rating.

Funny Corner



OSHA introduces its new hazard symbol:
"Are you nuts? Don't touch this."

Puzzle Answers



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Safety Quotes

Chance takers are accident makers.

~Author Unknown

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