

# Nanomaterials Safety Fact Sheet

Nanomaterials are materials created using nanoparticles. Nanomaterials can be defined as materials possessing, at minimum, one external dimension measuring between 1 and 100 nanometers. Modern nanomaterials were first founded in the early 1980s. They may be present as tubes, many particles, and/or rods and fibers. Even though nanomaterials can potentially be harmful to humans and the environment, they do have some positive side effects. When it comes to environmental statuses, the contaminants within the environment can be taken in by synthetic nanoparticles, henceforth reducing the concentrations and effects of toxic pollutants. For humans, besides the reduced pollution, nanomaterials are used widely, including to make cement more durable and to make our clothes last longer and feel more lightweight.

▶▶▶ **Risks:** Nanomaterials may be quite toxic to the human tissues and cell membranes depending on the composition and concentration of the material. Inhaled nanomaterials may inflame and/or damage the respiratory tract. Some nanomaterials may penetrate cell membranes and cause damage to intracellular structures or cellular function, and/or cytotoxicity. Some nanomaterials may even be pyrophoric or readily combustible and create a risk of fires or explosions. Inhalation typically presents the largest risk with nanomaterials.

Common Examples of Nanomaterials:	
Nano Silver	Microionized Copper
Carbon Nanotubes	Cosmetics
Cerium Dioxide	Sunscreening Agents
Titanium Dioxide	Silica Gel
Iron	Graphite

Nanomaterials can be very dangerous and should be used with extreme caution. Labs that use nanomaterials should develop a standard operating procedure (SOP) for use and train all personnel on this SOP before work with the nanomaterial.

## ▶▶▶ Personal Protective Equipment (PPE)

**& Handwashing:** UNO requires that lab workers wear closed-toe shoes, long pants or skirts, safety glasses, and gloves at all times when in a laboratory. However, when working with certain nanomaterials, personnel may also be required to wear long sleeves, a lab coat, and/or a face shield.

Touching or being otherwise exposed to nanomaterials can be very dangerous. Therefore, if you are working with nanomaterials, you should remember to:

- Wash hands thoroughly before and after use of nanomaterials
- Wear gloves, long sleeves, long pants, and closed-toe shoes at all times when around the use of nanomaterials

Do Wear:	Do Not:
Closed-toe shoes	Work with nanomaterials without being trained on the lab's SOP
Long pants and sleeves	Wear sandals or have otherwise exposed foot
Safety Glasses with side shields	Wear loose sleeves or short sleeves
Lab coats	Have an exposed face
Chemical Resistant Gloves	Have exposed hands or lower arms

▶▶▶ **Appropriate Handling:** The misuse of nanomaterials could be dangerous and harmful. Here are some things you could do to ensure the safety of yourself and your fellow lab personnel:

- Do not run with substances.
- Do not put near face or others' faces.
- Do not eat or drink in the lab.
- Wear your PPE correctly, inspecting for damage before working with nanomaterials.
- Change PPE before you leave the lab and if it becomes damaged.
- Ensure your emergency equipment is ready for an exposure at all times:
  - Handwashing sinks should always be stocked with paper towels and soap.
  - Eyewash stations should have protective caps that fly off when the eyewash station lever or handle is pulled. Eyewash station should be tested monthly and documentation of testing should be available.
  - Safety showers should be tested monthly and documentation of testing should be available.
- Keep labs clean and organized. Use standard housekeeping practices, including keeping surfaces clean and decontaminated.
- Wash your hands frequently.
- Know your chemical inventory and be aware of the location of your lab's safety data sheets (SDSs). Always read the SDS before working with a nanomaterial or other chemical.

▶▶▶ **Emergency Response:** If you are exposed to nanomaterials, yell for help and immediately respond to your exposure:

- Exposure in your eyes → Push the lever or pull the handle on the eyewash station to begin the flow of the water. Hold your eyelids back and expose your eyeballs to the water for 15 minutes while slowly rotating them.
- Exposure on your face → Wash face immediately using the handwashing sink or safety shower for 15 minutes. Hand soap may be used depending on the nanomaterial.
- Exposure to your hands → Wash hands immediately using the handwashing sink or safety shower for 15 minutes. Hand soap may be used depending on the nanomaterial.
- Exposure to your body (torso, back, legs, arms, feet) → Push the lever or pull the handle on the safety shower to begin the flow of the water. Remove contaminated clothing. Rinse the exposed areas of your body for 15 minutes. Hand soap may be used depending on the nanomaterial.

After emergency response procedures listed above, ensure your supervisor knows about your exposure. Medical attention may be required. If so, call 911 and the UNO Department of Public Safety and Security at 504-280-6666. Fill out an Accident Investigation in Workday under [Report Safety Incident](#).

If you have any questions about the contents of this Fact Sheet, contact the UNO Lab Safety Officer at [labsafety@uno.edu](mailto:labsafety@uno.edu).