# University of Arizona

## Nickel Compounds Standard Operating Procedure

*[This is a template. Fill in all necessary blanks and delete all highlighted areas when complete. Add any sections necessary for your laboratory. This will be appended to your Laboratory Chemical Hygiene Plan.]*

**Title:**  **Click here to enter the title of your SOP.**

**Approval Holder (AH):** Click here to enter text **Approval #:** Click here to enter text

**Approval Holder Phone Number(s):** Click here to enter text

**Approval Safety Coordinator (ASC):** Click here to enter text

**Approval Safety Coordinator Phone Number(s):** Click here to enter text

**Department:** Click here to enter text

1. **Purpose**

This standard operating procedure (SOP) is intended to provide guidance on how to safely store, handle, use, and dispose of nickel compounds in Enter AH’s name’s laboratory. Laboratory personnel should review this SOP, as well as the appropriate Safety Data Sheet(s) (SDSs), before Describe the procedure or process this SOP will address. If you have questions concerning the requirements within this SOP, contact your Approval Holder (AH) or Approval Safety Coordinator (ASC).

1. **Scope**

*[Describe when this SOP applies and to whom this SOP applies.]*

1. **Hazard Description**

*[Describe the hazards presented by the procedure or process this SOP addresses. What makes it hazardous? Provide an example, if applicable.]*



Nickel is a carcinogen, skin and respiratory sensitizer and irritant. Nickel compounds may cause dermatitis or nickel itch. Nickel compounds may also cause intestinal disorders, convulsions and asphyxia. Nickel dusts are regarded as carcinogenic to the respiratory tract. Repeated exposure to vapors and dust can cause eye injury and can cause sensitization by skin contact. Harmful if inhaled and can cause delayed lung injury. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Nickel dermatitis, consisting of itching of the fingers, hands, and forearms, is the most common effect in humans from chronic (long-term) skin contact with nickel. Respiratory effects have also been reported in humans from inhalation exposure to nickel. Human and animal studies have reported an increased risk of lung and nasal cancers from exposure to nickel dusts.

1. **Process & Hazard Controls**

*[Describe the steps needed to set up and complete the procedure or process in safe manner following the* [*hierarchy of controls*](https://www.cdc.gov/niosh/topics/hierarchy/default.html)*. Use as much detail as is necessary to ensure all laboratory workers can complete the procedure or experiment safely.]*

* 1. **Elimination/Substitution**

*[Describe any eliminations of hazardous chemicals or processes; alternatively, any substitutions with less hazardous alternatives that could be used to accomplish the task.]*

* 1. **Engineering Controls**

*[Describe any engineering controls (e.g. fume hoods, gas cabinets, local exhausts, blast shields, etc.) that are used to safely accomplish the task.]*

* **Fume hoods or other RLSS approved local exhaust ventilation are strongly recommended for all uses of nickel compounds; consult RLSS before performing operations or experiments with nickel chloride.**
  1. **Work Practices**

*[Describe any work practices (e.g. staggering schedules, additional cleaning measures for particulates, etc.) that are used to safely accomplish the task.]*

**Housekeeping and cleaning**: As with other metals and powders, the use of wet cleaning methods and disposable mats are recommended to prevent contamination of the use and surrounding areas when working with nickel compounds.

* Place a disposable mat under all nickel use and storage areas.
* Dispose of mats after uses of nickel.
* Always use a pre-wetted, disposable cloth to wipe down nickel use areas once work has concluded for the day.
  + Also wipe the floor in front of and/or around the use area to prevent general laboratory contamination.
* Use a specific lab coat for nickel compound work; clean regularly via professional dry cleaning service. Nickel and other metals compounds easily cling to clothing and can be taken home to expose workers and relatives in the home.
* Wash hands rigorously and regularly to prevent accidental ingestion after working with nickel compounds.
  1. **Personal Protective Equipment**

*[Describe the personal protective equipment needed to adequately protect laboratory workers when performing the process or procedure addressed by this SOP. Ensure to specify any personal protective equipment beyond the minimum (i.e. safety glasses, lab coat, gloves, long pants and closed-toed shoes).]*

* **Hand and Arm Protection**: For heavy or extended use, recommend double gloving using nitrile gloves.
* **Eye and face protection**: Safety glasses or goggles.
* **Body Protection**: Use a specific lab coat for nickel compound work; clean regularly via professional dry-cleaning service. Nickel and other metals compounds easily cling to clothing and can be taken home to expose workers and relatives in the home.
* **Respiratory Protection**: Respirators may be required if exposures are not able to be adequately controlled by the use of engineering controls or other means. All uses of respiratory protection require RLSS assessment and consultation (for assessment of work, selection of respirator and filtration, and OSHA-mandated medical clearance and fit testing). Contact [rlss-ppe@arizona.edu](mailto:rlss-ppe@arizona.edu) with any questions or concerns.
  1. **Transportation and Storage**

*[Describe how to safely transport and/or store (e.g. ventilated cabinet, flammable cabinet, under inert blanket, etc.) the hazardous chemical(s) or processes.]*

It is essential that all regulated carcinogens be stored separately from all chemicals with which they may react. Store in a cool, dry and well-ventilated area away from incompatible substances. Materials to avoid include bromine trifluoride, acids, oxidizing agents, sulphur compounds, hydrogen gas, oxygen, methanol, organic solvents, aluminium, fluorine, ammonia. Ensure segregation of incompatible chemicals. Also, follow any substance-specific storage guidance provided in Safety Data Sheet (SDS) documentation. This is particularly important for regulated carcinogens as human exposure must be avoided.

1. **Spills, Cleanup & Disposal**

*[Describe how to safely end the procedure or process, clean up the process or spills, and/or dispose of any waste generated.]*

**Spills:**

Spills should always follow the [University Chemical Hygiene Plan](https://rgw.arizona.edu/sites/default/files/cs-univeristy_chemical_hygiene_plan.pdf) Section 8.2.

**Exposure Response**

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| --- | --- | --- | --- |
| **Inhalation** | **Ingestion** | **Skin Contact** | **Eye Contact** |
| If breathed in, move person into fresh air. If not breathing, give artificial respiration.  Consult a physician. | Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult  a physician. | Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a  physician. | Flush eyes with water as a precaution. |

1. **Enter Additional Section Title**

*[Add as many sections as necessary to adequately describe how to safely perform the procedure or process addressed by this SOP.]*

1. **References:**

* [www.cchem.berkeley.edu](http://www.cchem.berkeley.edu)
* ehs.oregonstate.edu
* <https://ehs.oregonstate.edu/sds>
* <https://hazard.com/msds/f2/bjr/bjrpz.html>

<https://ehs.yale.edu/sites/default/files/files/carcinogens-sop.pdf>