Lab Safety: RuO4

- RuO4

Note:

- Ruthenium tetroxide is a strong oxidizing agent and must be stored in the refrigerator away from direct sunlight. It reacts violently with filter paper and alcohol.
- Do not place ruthenium tetroxide solutions into waste containers containing alcohol, ether benzene, pyridine, or other organic compounds.
- Vapors are irritating to eyes and the respiratory tract.
- Wear protective goggles and gloves and handle only in a fume hood.
- In case of spillage, flush with sodium bisulfite solution to decompose RuO4 and then flush with plenty of water.

Lab Safety:

- Reaction used to create RuO4 for staining:

$$2\,RuCl_3 \cdot H_2O + 8NaClO \xrightarrow{H_2O} 2\,RuO_4 + 8NaCl + 3Cl_2 + 3H_2O$$

Figure 2.10. Ruthenium tetroxide is synthesized *in situ* by oxidation of ruthenium trichloride with sodium hypochlorite.

RuCl3

Stability: Stable
Conditions to Avoid: No data
Incompatibility (Material to Avoid): Iron carbonyl, zinc, magnesium, aluminum.
Hazardous Decomposition Products: Cl_2, RuO_4
Hazardous Polymerization: Will not occur

Respiratory Protection: NIOSH/MSHA approved dust respirator
Ventilation: Use local exhaust to maintain concentration at low levels. General exhaust is recommended.

Protective Gloves: Rubber
Eye/Face Protection: Safety goggles
Other Protective Equipment: Normal Labwear

Sodium hypochlorite:

HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. CAUSES SUBSTANTIAL BUT TEMPORARY EYE INJURY.

Health Rating: 2 - Moderate
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 3 - Severe
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Incompatibilities:
Ammonia (chloramine gas may evolve),amines, ammonium salts, aziridine, methanol, phenyl acetonitrile, cellulose, ethyleneimine, oxidizable metals, acids, soaps, and bisulfates.