Safety Module

Safety Topic: Potassium chlorate

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Compound **CAS#** 3811-04-9

- **Purpose –** Potassium chlorate ($KClO_3$) is a very common oxidizer in pyrotechnics and other reactions. $KClO_3$ is categorized as class 3 oxidizer by NFPA, which is divided by the severity of risk when mixed with other compounds:

NFPA classification of oxidizers

Class 1	Does not moderately increase the burn rate of another material
Class 2	Moderately increase the burn rate
Class 3	Causes a severe increase in burn rate
Class 4	Potentially explosive oxidation when combined with other materials

- **Equipment –** Lab glasses, lab coat, nitrile gloves, empty glass waste bottle, plastic secondary container, blast shield, ventilation hood.
- **Process –** Carefully consider what you are mixing with $KClO_3$. It can react vigorously when mixed with many combustible organic compounds. Sulfur compounds and red phosphorus should be avoided in reactions containing $KClO_3$, as well as any acidic salts. These mixtures are shock and friction sensitive and prone to spontaneous deflagration. Molten $KClO_3$ will ignite any combustible material and can burn even through standard lab safety clothing. Keep away from an open flame. The combustion products of oxidizer-fed fires are generally more toxic than other combustible materials. Chlorinated products like HCl are released which are corrosive to living tissue. Impurities in $KClO_3$ itself can also cause problems so new pure material is best. When working with $KClO_3$, it is advisable to work safely behind a blast shield or hood sash.
- **Specific considerations –** Contact can cause eye and skin irritation or burns. Breathing in $KClO_3$ can irritate the nose, throat and lungs. High concentration of $KClO_3$ can interfere with the ability of the blood to carry oxygen causing headache, weakness, dizziness and a blue color to the skin. Higher levels can cause trouble breathing, collapse and even death
- **Waste handling –** $KClO_3$ waste should be collected separately and never mixed with or stored near any organics or reducing agents. Do not let this waste build up; call for pickup by EHS.
- **For more information see –**
  - https://nj.gov/health/eoh/rtkweb/documents/fs/1560.pdf
  - https://ehs.yale.edu/sites/default/files/files/strong-oxidizer-sop.pdf
  - https://www.sigmaaldrich.com/catalog/product/sigald/255572?lang=en&region=US
  - https://en.wikipedia.org/wiki/Potassium_chlorate
  - https://www.cdc.gov/niosh/ipcsneng/neng0548.html