Silver(i) Oxide Encyclopedia Article

Silver(i) Oxide

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Silver(i) Oxide

Overview

Silver(I) oxide (SILL-ver one OK-side) is an odorless dark brown or black powder with a metallic taste. It is used primarily for polishing glass, the purification of water, and coloring glass.

How It Is Made

Silver(I) oxide is made by reacting silver nitrate ($AgNO_3$) with sodium or potassium hydroxide (NaOH or KOH). For example:

$2AgNO_3 + 2NaOH \rightarrow Ag_2O + 2NaNO_3 + H_2O$

The silver(I) oxide settles out as a precipitate that can then be washed and purified.

Key Facts

Other Names:

Silver oxide; argentous oxide

Formula:

Ag_2O

Elements:

Silver, oxygen

Compound Type:

Metallic oxide (inorganic)

State:

Solid

Molecular Weight:

231.74 g/mol

Melting Point:

Decomposes at about 200°C (400°F)

Boiling Point:

Not applicable

Solubility:

Slightly soluble in water; insoluble in ethyl alcohol

Common Uses and Potential Hazards

Silver(I) oxide finds limited commercial and industrial application. It is used as an ingredient in the manufacture of glass to give a yellowish caste to the glass. It is also a component of mixtures used to polish glass, including the glass used in optical lenses. Silver(I) oxide is also used as a catalyst in certain industrial operations and in some water purification systems.

Words to Know

AQUEOUS
- Referring to a solution that consists of some material dissolved in water.

PRECIPITATE
- A solid material that settles out of a solution, often as the result of a chemical reaction.

Silver(I) oxide is a skin, eye, and respiratory irritant that may cause coughing, wheezing, shortness of breath, and pulmonary edema (accumulation of fluid in the lungs). It can also cause burning of the eyes and skin. Ingestion can produce burning of the gastrointestinal tract accompanied by nausea, vomiting, and abdominal pain. Long-term exposure to silver(I) oxide can cause argyreia, a bluish-gray discoloration of the skin, eyes, and mucous membranes (the soft tissues lining the breathing and digestive passages).

For Fur Ther Information

"Material Safety Data Sheet." IC Controls. http://www.iccontrols.com/files/a1100122.pdf (accessed on November 5, 2005).

"Silver(I) Oxide." Patnaik, Pradyot. *Handbook of Inorganic Chemicals*. New York: McGraw-Hill, 2003, 842-843.

"Silver Oxide." Chem007. http://www.chem007.com/specification_d/chemicals/supplier/cas/Silver%20oxide.asp (accessed on November 5, 2005).