








Silver and its compounds

including Silver bromide, chloride, iodide, nitrate(V) and oxide

Substance	Hazard	Comment
Silver (metal) Solid	LOW HAZARD	It is used in jewellery. It is an approved food additive, E174.
Silver halides , ie, silver bromide, chloride and iodide Solids	LOW HAZARD	Widely used in photographic emulsions. They are decomposed by light to give silver metal and the halogen (which then reacts with other substances in the emulsion).
Silver nitrate(V) Solid and fairly-concentrated solutions (<i>If 0.3 M or more</i>)	  OXIDISER CORROSIVE  ENVIRONMENTAL HAZARD	DANGER: oxidiser; causes severe skin burns and eye damage; very toxic to aquatic life. If swallowed, it may cause internal damage due to absorption into the blood, followed by deposition of silver in various tissues. The solid explodes dangerously with magnesium powder and a drop of water. Accidents have caused many injuries and a very careful risk assessment is required before attempting this.
Silver nitrate(V) Dilute solutions (<i>if less than 0.3 M but 0.18 M or more</i>)	 CORROSIVE	DANGER: causes severe eye damage; irritating to skin. It may produce black stains on the skin, which, however, wear off in a few days.
Silver nitrate(V) Very dilute solutions (<i>if less than 0.18 but 0.06 M or more</i>).	 IRRITANT	WARNING: irritating to eyes and skin. Very dilute solutions are adequate for most school work when testing for halides in solution.
Silver nitrate(V) Extremely dilute solutions (<i>if less than 0.06 M</i>)	LOW HAZARD	
Silver nitrate(V) (ammoniacal) ie, in ammonia solution (<i>Tollen's Reagent</i>)	  EXPLOSIVE IRRITANT	It is used for aldehyde tests and should be prepared only on a test-tube scale , when needed, and discarded into plenty of water within ½ hour, otherwise explosives may form. Failure to do this has caused accidents.
Silver oxide Solid	LOW HAZARD	It is used in some batteries, eg, button cells for watches and calculators.

Typical control measures to reduce risk

- Use the lowest possible concentration; wear eye protection.
- Avoid keeping solutions of silver compounds and ammonia for more than a few minutes.
- Avoid handling solid silver nitrate.

Assessing the risks

- **What are the details of the activity to be undertaken? What are the hazards?**
- **What is the chance of something going wrong?**
Eg, Silver nitrate accidentally coming into contact with the skin.
- **How serious would it be if something did go wrong?**
Eg, Are there hazardous reaction products, eg, from solutions of silver compounds with ammonia?
- **How can the risk(s) be controlled for this activity?**
Eg, can it be done safely? Does the procedure need to be altered? Should goggles or safety spectacles be worn?

Emergency action

- **In the eye** Flood the eye with gently-running tap water for at least 10 minutes. Consult a medic.
- **Swallowed** Do no more than wash out the mouth with water. Do **not** induce vomiting. Consult a medic.
- **Spilt on the skin or clothing** Remove contaminated clothing and rinse it. Wash off the skin with plenty of water. If the silver nitrate produces more than small burns, consult a medic.
- **Spilt on floor, bench, etc** Wear eye protection and gloves. Scoop up the solid. Rinse the area with water and wipe up, rinsing repeatedly. Rinse the mop or cloth thoroughly.