Silver *and its* compounds

including silver bromide, chloride, iodide, nitrate(V) *and* oxide

Substance	Hazard	Comment
Silver (metal) *Solid*	**Currently not classified as hazardous**	It is used in jewellery. It is an approved food additive, E174.
Silver bromide, **chloride** and **iodide** *Solids*		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 (if 0.3 M or more)*	 **OXIDISING**  **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 (if less than 0.3 M but 0.18 M or more)*	 **CORROSIVE**	DANGER: causes severe eye damage; irritating to skin. It may produce black stains on the skin, which wear off in a few days.
Silver nitrate(V) *Very dilute solutions (if less than 0.18 M but 0.06 M or more)*	 **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 (if less than 0.06 M)*	**Currently not classified as hazardous**	–
Silver nitrate(V) (ammoniacal) (Dissolved in ammonia solution) (Tollen's Reagent)	 **EXPLOSIVE**  **IRRITANT**	It is used for aldehyde tests and should be prepared only on a test-tube scale, when needed. Dispose of into plenty of water within 30 minutes, otherwise explosives may form. Failure to do this has caused accidents.
Silver oxide *Solid*	**Currently not classified as hazardous**	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.

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 such as 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 all emergency situations, alert the responsible adult immediately. Be aware that actions may include the following:

- In the eye — Irrigate the eye with gently-running tap water for at least 20 minutes. Call 999/111.
- In the mouth/swallowed — Do no more than rinse and spit with drinking water. Do not induce vomiting. Call 999/111.
- Spilt on the skin or clothing — Remove contaminated clothing. Irrigate the affected area with gently-running tap water for at least 20 minutes. Call 999/111 as appropriate. Rinse clothing.
- Spilt on the 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.

