

Silver Mirror

Ed Escudero

Summit Country Day School Cincinnati, OH 45208-3300

Solutions: (These solutions are stable and may be stored in plastic bottles for years.)

Solution (A) Sucrose, Tartaric Acid, and Ethanol

Dissolve 25.0 g of sucrose in 250 mL of distilled water and add 30.0 g of tartaric acid. Boil the solution for ten minutes, cool, and then add 50 mL of ethanol. Dilute to 500 mL. (0.15 M sucrose, 0.040 M tartaric acid, and 1.70 M ethanol.

Solution (B) Silver Nitrate and Ammonium Nitrate

Dissolve 20.0 g of silver nitrate and 30.0 g of ammonium nitrate in water and dilute to 500 mL. (0.24 M silver nitrate and 0.75 M ammonium nitrate)

Solution (C) Sodium Hydroxide

Dissolve 50.0 g of sodium hydroxide in distilled water and dilute to 500 mL. (2.50 M sodium hydroxide)

Instructions:

Use equal volumes of the three silver solutions when mirroring a glass bottle/container. A beaker full of each solution will silver a liter bottle.

Carefully clean the glass bottle/surface prior to silvering. Any grease, finger marks, etc will prevent the silver from adhering to the glass. Rinse the container with distilled water prior to silvering. Glass water bottles or soda bottles work well because the bottles are clean.

Squeeze or pour in solution A followed by solution (B). At this point stopper the bottle and swirl the contents so that the interior surface is coated with the mixed A and B. Add solution C and, quickly stopper the bottle, mix the solutions, and swirl the contents so that they coat all of the interior surface of the bottle. Continue to tilt and swirl the contents over the interior surfaces until a shiny silver mirror covers the glass.

The residual contents of the bottle may be rinsed down the sink accompanied by copious amounts of water. Do not allow the residue to dry. A contact explosive may form.

Rinse the bottle with distilled water several times. Allow the water to drain from the bottle and stopper the bottle. The silver mirror will last for years if left undisturbed. Diluted varnish may be poured into the bottle and then allowed to drain out if one would like a more permanent mirror that will not wipe away.

Safety: Follow procedures recommended for handling caustic materials. The silver nitrate will stain the skin and the sodium hydroxide is a strong base. Use gloves, goggles, and aprons.