

Create a Silver Christmas Test Tube Ornament

Introduction In 1835, German chemist Justus von Liebig invented a process to silver-plate mirrors. In this process, dissolved silver ions (Ag^+) are converted into metallic silver by reducing their charge to zero with a sugar, dextrose. Today, you will be re-enacting this process and producing a silvered test tube which you may keep as a Christmas tree ornament.

Safety Sodium hydroxide solution is corrosive to skin and eyes. Wear safety glasses! Silver nitrate solution will stain skin and clothing. Ammonium nitrate solution is toxic by ingestion. Wash your hands after the lab is done. Ammonia vapors will be given off by the reaction. Do not bring the mouth of the test tube close to your face.

Procedure

1. Using a pipet, add a squirt of acetone to the inside of your test tube. Thoroughly rinse the walls of the tube to remove any dust or chemical residue. Pour the acetone into the front sink and rinse it down with water. Allow the test tube to air dry for a few minutes. Do not blow into the test tube!
2. Using a small graduated cylinder, measure 2.5 mLs of silver nitrate solution into a small beaker.
3. Using a small graduated cylinder, measure 2.5 mLs of ammonium nitrate solution and place it into the same small beaker. Swirl to mix the silver nitrate and ammonium nitrate solutions.
4. Using a small graduated cylinder, measure 5.0 mLs of dextrose solution. Place this solution into the test tube, not the beaker.
5. Using a small graduated cylinder, measure 5.0 mLs of sodium hydroxide solution. **Don't add this to anything yet.**
6. Add the combined silver nitrate/ammonium nitrate solution to the test tube, followed *immediately* by the sodium hydroxide solution.
7. Cover the mouth of the test tube with a piece of Parafilm. Rotate the test tube constantly, so a thin even film of silver coats the inside of the tube.
8. After a silver coating has formed inside the test tube, pour out the liquid into the waste beaker at the front sink.
9. Rinse your test tube with a squirt of acetone. Allow your test tube to dry for a few minutes.
10. Add a string and you now have a silver test tube Christmas tree ornament!
11. Please clean and dry your small beaker and return it to the front.

Silver nitrate solution

Place 2.5 mLs into a small beaker.

Dextrose solution

Place 5 mLs into the test tube.

Ammonium nitrate solution

Place 2.5 mLs into the small beaker.

Sodium hydroxide solution

Place 5 mLs into the test tube, but only after you've put in the silver nitrate/ammonium nitrate solution.