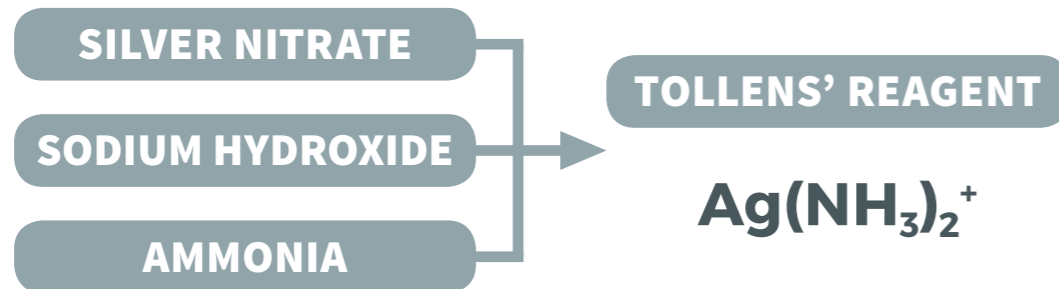
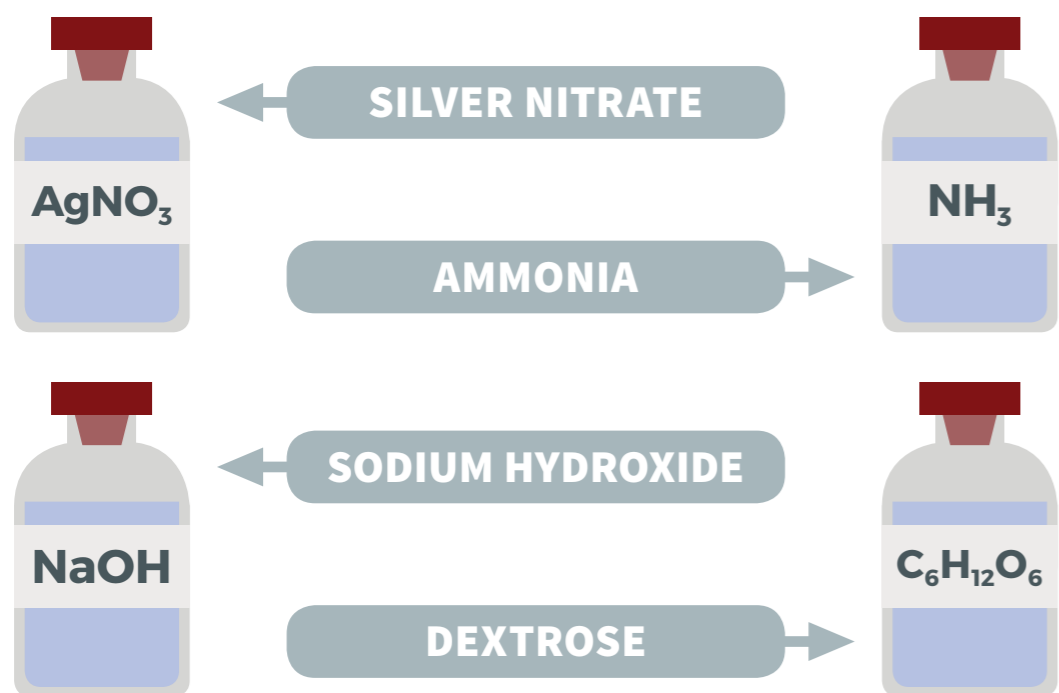


MAKING SILVER MIRRORS WITH CHEMISTRY

Glass surfaces can be given a coating of silver with a particular chemical reaction. Here we look at how this reaction works!

THE REAGENTS

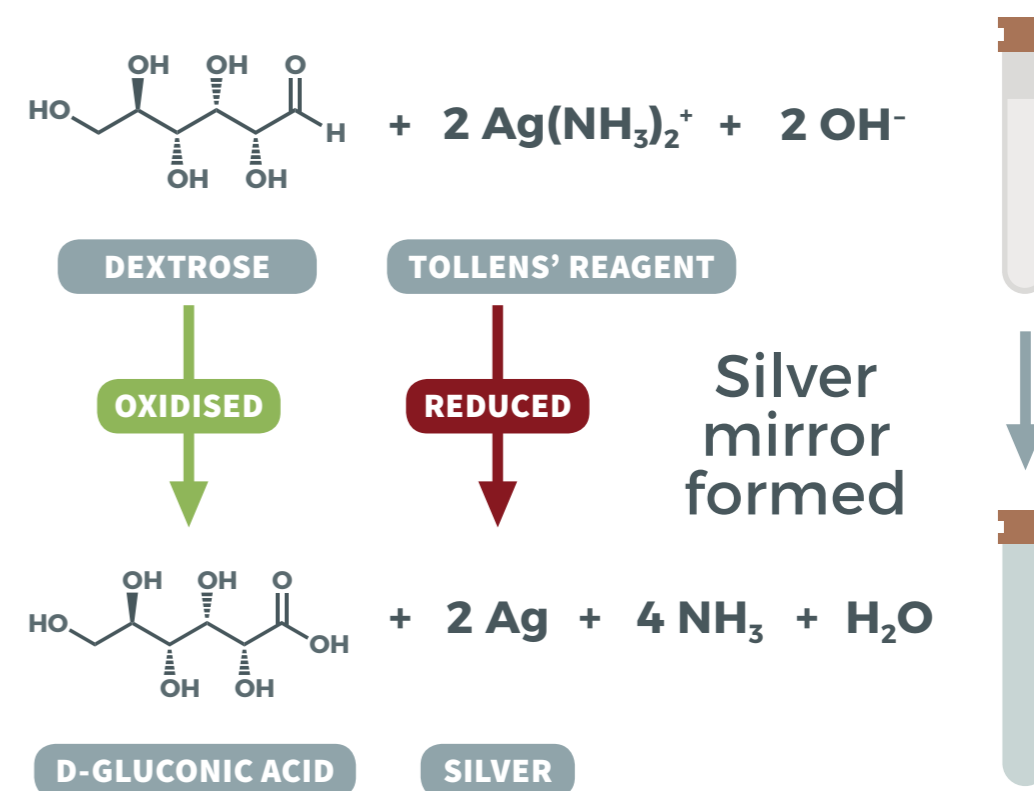


Tollens' reagent is made by mixing silver nitrate, ammonia, and an alkaline solution (commonly a hydroxide). It is a colourless solution of a diamminesilver(I) complex. Due to the risk of explosive silver nitride forming, it must be used shortly after preparation and then disposed of safely.



THE REACTION

When an aldehyde is added to Tollens' reagent the aldehyde is oxidised to form a carboxylic acid, and the diamminesilver(I) ions are reduced to metallic silver. The diamminesilver(I) ions are more difficult to reduce than silver ions, producing a silver coating in a controlled manner.



Using silver nitrate without ammonia leads to a colloidal suspension of silver, giving a black, cloudy appearance. Basic conditions are used because dextrose is more easily oxidised under these conditions.

