

Silver nanoparticles

AgNPs

Silver nanoparticles (colloids, AgNPs) are one of the most popular noble metal nanostructures. Due to their antibacterial and antifungal properties they are frequently employed in the production of dressings, antibiotics, antibacterial fabrics, plastics and cosmetics. Also there are studies of their use in the manufacture of solar cells, microelectronics and printing inks.

Realization:

Dextrin-stabilized colloidal silver is prepared by two methods - in hot and in cold water. 10 mL of an aqueous solution of a given dextrin at a concentration of 50 g/L is placed in a reaction vessel. Silver in the reaction mixture is sourced from 10 mL of the ammonia solution of silver(I) nitrate at a concentration of silver ions of 1 g/L. It is obtained by combining the aqueous solution of silver(I) nitrate and aqueous solution of ammonia.

After mixing the solution of ammonia complex of silver ions and the solution of dextrin, the mixture can be observed to change its color gradually (after aprox. 7 days) from white or creamy color to yellow.

Equipment:

- Volumetric flask for 100 cm³,
- Magnetic stirrers (one of them with heating),
- Dipoles,
- Automatic pipette.

Reagents:

- Silver(I) nitrate, concentration of silver ions of 1 g/L,
- Three types of dextrin (0.5 g),
- Ammonia (25%),
- Distilled water.

