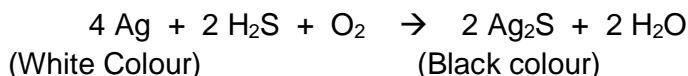


CORROSION OF SILVER

The equation of corrosion of Silver is:



The deformation of a metal by the reaction with oxygen (Oxidation) is rust. Tarnishing means the outer layer of metals combines with other elements (Oxidation) and loses their shine and colour.

The tarnishing of Silver occur when Hydrogen Sulphide (H₂S) together with Oxygen (O₂) is available. Sometimes Silver directly reacts with Sulphur.

Silver oxide is in grey black colour. But Silver does not tarnish when it keep in oxygen. The formation of Silver oxide does not possible directly. When the aqueous solutions of Silver nitrate and Alkali bases reacts together and form Silver hydroxide (AgOH). This AgOH again turned into Silver Oxide (Ag₂O).



Silver does not rust. It can fade. Fading of Silver is called tarnishing of Silver. Rust as a common term is iron oxide. In specific conditions silver can oxidise but silver can not rust. Silver tarnished. The tarnish of silver depends upon the humidity, gas concentration and time of exposure. Silver will react extremely at low levels of H₂S. The colour of Silver sulphide is grayish black.



What are the circumstances that Silver to corrode?

The Hydrogen sulphide levels in atmosphere can be measured in ppb units. 1 ppb means 1 part per billion. H₂S is generally present in air at a range of 8 ppb. The tarnishing of silver takes place even when it is in the range of 1 ppb to 10 ppb.

Why we can not Observe the smell?

Hydrogen sulphide produces rotten eggs odor. More than 80% of people observe the smell when the levels of H₂S in air at 50 ppb. Most of the people can smell it when it is in 150 ppb. But the tarnishing of silver starts from 1 ppb. So we may not observe the smell.

Where do the Silver get Sulphur content at houses?

Concentration of sulphur content is more at industrial areas. Sulphur content is releases from industrial wastage, oil refining industries. At Other places it comes from rotten eggs, sewer gases, animals, plumbing drains, oil tanks, pesticides, toilet cleaners, septic odors, crude oil burns, coal burns, vehicles.

Range of Sulphur contents	Effects on human beings
0 - 10 ppm	Irritation of eyes, nose, throat
10 - 50 ppm	Headache, vomiting, cough, difficulty in taking breathe
50 - 200 ppm	Respiratory track irritation, eye irritation with severe rage, coma, death

ppm- parts per million

So Silver corrode and fade. The Black layer formed at the surface of silver is called patina. Silver won't rust. Silver will tarnish. Rust will always rough. If we scratch the rust we get flakes of rust. Patina is a smooth discoloration without pitting. If we scratch the patina, we can not get any flakes.

More over Hydrogen sulphide is heavier than air. It is always lies at lower levels in atmosphere. So tarnishing of Silver takes place. But the corrosion of less reactive metals is very less compared to that of the corrosion of high reactive metals. As Silver, Gold are less reactive metals, we are very safe that the Silver and Gold ornaments get corrode slowly.