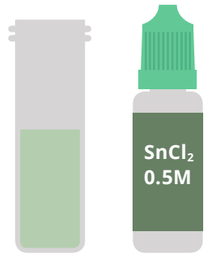
THE TIN HEDGEHOG EXPERIMENT

In this reaction, a zinc pellet turns into a tin hedgehog! Here's a look at the chemistry behind this impressive transformation.

THE EXPERIMENT

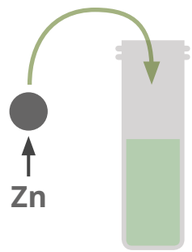
Tin (II) chloride: irritant –avoid eye and skin contact. Tin (II) chloride and zinc: harmful to aquatic organisms, shouldn't be disposed of down the sink.

1



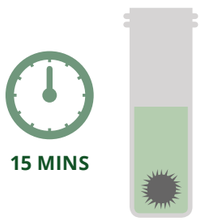
First, a plastic vial is half-filled with a 0.5 M solution of tin (II) chloride. The reaction takes longer with more dilute solutions of tin (II) chloride.

2



A small zinc pellet is taken and placed into the vial. The zinc pellet will slowly react with the tin (II) chloride solution.

3



As the zinc reacts with the tin (II) chloride solution, thin crystals of tin will grow from the pellet's surface, giving the appearance of a tin hedgehog!

THE EXPLANATION

$SnCl_2$ + Zn → $ZnCl_2$ + Sn

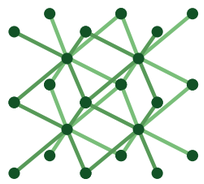
TIN (II) CHLORIDE | ZINC | ZINC CHLORIDE | TIN

- SODIUM (Na)
- ALUMINIUM (Al)
- ZINC (Zn)
- IRON (Fe)
- TIN (Sn)
- COPPER (Cu)

INCREASING REACTIVITY

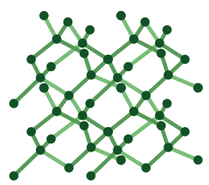
The tin hedgehog is produced due to a displacement reaction occuring between the tin (II) chloride and zinc. This happens because zinc is more reactive than tin is, as shown by the reactivity series (left), and so displaces it from its compound, producing tin and zinc chloride.

ALLOTROPES OF TIN



WHITE TIN

GREY TIN



Our tin hedgehog's needles are actually only made of one type, or allotrope, of tin. Tin comes in two forms: white tin, which our needles are made of, and grey tin, formed below 13.2˚C, which is fragile and crumbly.