Most common oxidation states: +3, +5
M.P. 630°
B.P. 1380°
Density 6.69 g/cm³
Characteristics: Antimony is brittle and silvery. Not very active, but reacts with oxygen, sulfur and chlorine at high temperatures.
Characteristic reactions of \(\ce{Sb^{3+}}\): (Sb(III) is the more stable oxidation state.)

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**Chloride Ion:**

No reaction observable, but will be present as \(\ce{SbCl4^-}\).

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**Aqueous Ammonia:**

Sb(III) reacts with aqueous ammonia to precipitate white \(\ce{Sb(OH)3}\).
\[
\ce{Sb^{3+}(aq) + 3NH3(aq) + 3H2O(l) <=> Sb(OH)3(s) + 3NH4^{+}(aq) }
\]

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**Sodium Hydroxide**

Sodium hydroxide also precipitates \(\ce{Sb(OH)3}\), which is amphoteric and dissolves in an excess of hydroxide and in acids.
\[
\ce{Sb^{3+}(aq) + 3OH^{-}(aq) <=> Sb(OH)3(s)}
\]
\[
\ce{Sb(OH)3(s) + OH^{-}(aq) <=> Sb(OH)4^{-}(aq)}
\]
\[
\ce{Sb(OH)3(s) + 3H^{+}(aq) <=> Sb^{3+}(aq) + 3H2O(l) }
\]

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**Hydrogen Sulfide**

Under moderately acidic conditions, \(\ce{H2S}\) precipitates red \(\ce{Sb2S3}\).
\[
\ce{2SbCl4(aq) + 3H2S(aq) <=> Sb2S3(s) + 6H+(aq) + 8Cl(aq)}
\]

This sulfide is soluble in solutions of hot \(\ce{NaOH}\) which contain excess sulfide ion and in hot, concentrated (12 M) \(\ce{HCl}\).
\[
\ce{Sb2S3(s) + 3S2^{-}(aq) <=> 2SbS33(aq)}
\]
\[
\ce{Sb2S3(s) + 6H^{+}(aq) + 8Cl^{-}(aq) <=> 2SbCl4^{2-}(aq) + 3H2S(aq)}
\]
Solutions of antimony(III) chloride in \(\text{HCl}\) react when added to excess water to form the basic, white, insoluble salt \(\text{SbOCl}\).

\[
\text{SbCl}_4^- (aq) + \text{H}_2\text{O}(l) \rightleftharpoons \text{SbOCl}(s) + 2\text{H}^+(aq) + 3\text{Cl}^- (aq)
\]

Reducing Agents

In the presence of \(\text{HCl}\), either aluminum or iron will reduce \(\text{Sb}^{3+}\) to \(\text{Sb}\) metal, which will be deposited as black particles.

\[
\text{SbCl}_4^- (aq) + \text{Al}(s) \rightleftharpoons \text{Sb}(s) + \text{Al}^{3+}(aq) + 4\text{Cl}^- (aq)
\]

No Reaction

\[
\text{SO}_4^{2-}(aq)
\]