ACTION OF TIN(II) CHLORIDE ON CATIONS

$SnCl_2(aq)$ is a useful reducing agent, generally being oxidised to Sn(IV)(aq). It is likely that neither simple $Sn^{2+}(aq)$, nor $Sn^{4+}(aq)$, exists in solution.

CATION	EFFECT	EQUATION
Fe^{3+}	Yellow Fe^{3+} reduced to pale green Fe^{2+}.	$2Fe^{3+}(aq) + Sn(II)(aq) \rightarrow 2Fe^{2+}(aq) + Sn(IV)(aq)$
Cu^{2+}	Blue $Cu^{2+}(aq)$ reduced to white CuCl(s).	$2Cu^{2+}(aq) + Sn(II)(aq) + 2Cl^-(aq) \rightarrow Sn(IV)(aq) + 2CuCl(s)$
Hg_2^{2+}	Colourless $Hg_2^{2+}(aq)$ is first precipitated as white Hg_2Cl_2 which darkens as reduction occurs.	$Hg_2^{2+}(aq) + 2Cl^-(aq) \rightarrow 2Hg_2Cl_2(s)$ $Hg_2Cl_2(s) + Sn(II)(aq) \rightarrow Sn(IV)(aq)^1 + 2Hg(l) + 2Cl^-(aq)$
Hg^{2+}	Colourless Hg^{2+} is reduced to finely divided black Hg(l).	$Hg^{2+}(aq) + Sn(II)(aq) \rightarrow Sn(IV)(aq) + Hg(l)$

[1] Sn(IV) is often shown as Sn^{4+}, but it is very unlikely that the free ion exists in compounds.