

**CHEMICAL CONDITIONS IMPACTING THE REMOVAL EFFICIENCY OF
HG AND OTHER TOXIC TRACE METALS FROM WASTEWATER**

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The current generation of produced water or refinery wastewater treatment methods can achieve reasonable removable efficiencies in a multitude of environments. However, more restrictive discharge trace metals limits and more environmentally conscientious industrial practices are resulting in the need for improved treatment methods.

During recent study of a novel wastewater treatment technology, the authors investigated the removal efficiency of Hg and other toxic metals under a variety of conditions. The proprietary agent (FGS_MCX) investigated uses a thiol chelation mechanism to complex the target metals and then the complex is precipitated out of solution. As in all produced water treatment methods, any one of a number of ancillary conditions can harm the removal efficiency of this technique.

Inconsistent results for the removal of As and Se prompted a further investigation of the redox state of the metalloids. In both cases, the lower valence state (Se(IV) and As(III)) were removed >99% by the chelation agent, at the optimal pH. However, <5% of the higher oxidation states (Se(VI) and As(V)) were removed under these conditions.

The study also investigated the affect of the Hg speciation on removal efficiency. Dissolved ionic Hg was removed >99.999% and Mono-methyl Hg (MMHg) was removed >95%.