

# Heavy Metal Removal

Metals do not degrade in the environment. They can be very toxic to humans and animals, therefore industry must pre-treat wastewater and follow guidelines dictated by the EPA and their local authorities. The metals listed as hazardous commonly found in waste streams are as follows:

Antimony	Chromium
Nickel	Arsenic
Cobalt	Silver
Barium	Copper
Selenium	Beryllium
Lead	Vanadium
Cadmium	Mercury
Zinc	

## FAQ

Q. How do I remove mixed metals in my waste stream?

A. Traditional Hydroxide Precipitation is effective but limited, especially with mixed metals and chelated metals. Heavy Metal Precipitants (HMP) are very effective at enhancing the efficiency of removing metals down to PPB levels.

Q. What are common sources of Chelating Agents?

A. Soaps, Cleaners and Detergents

Q. Will Hexavalent (6+) Chrome precipitate?

A. Typically Hexavalent Chrome is removed first by reducing the chrome to its Trivalent State (Cr 3+). The first stage involves pH adjustment to 2.5 to promote reduction reaction. Then addition of a reducing agent, like sodium bisulfite. This should be high mix for at least 10 – 15 minutes. The second stage is to raise the pH to 7.5-8.5 where trivalent chrome will precipitate. Coagulants and Flocculants are also typically used to promote efficient clarification.

Q. Are there any products that will not contribute as many solids as Lime (Calcium Hydroxide)?

A. Yes, you may possibly switch to liquid caustic soda if you improve the efficiency of your heavy metal precipitation scenario. This can be done through optimization of coagulation and flocculation reactions utilizing polymerized coagulants and/or flocculants. We can help you design a cost effective program.

Q. What is a coagulant vs. a flocculant?

A. A coagulant is a highly charged cationic organic, inorganic, or blend that serves to neutralize the charge on the suspended solids during clarification. A flocculant bridges these coagulated solids together by molecular weight and charge. Flocculants are typically an oil or latex-based chemistry.

Q. What are typical dosage ranges for Coagulants and Flocculants?

A. Inorganic Coagulants (50 - 200 PPM); Organic Coagulants (1 - 100 PPM); Anionic Flocculants (0.5 - 10 PPM); Cationic Flocculants (0.5 - 50 PPM)

**Below is a precipitation curve examining pH verses concentration of dissolved metals:**

