



Optimizing Metals Removal

To remove metals from wastewater, the metals need to be insoluble (not in solution). Many facilities, such as in the plating operations, use chelating agents to keep the metals in solution thus insuring a uniform and continuous layer of plated metal. Other chelating agents come in the form of ammonia and organic compounds that tend to bind the metal ions in a soluble state even when the pH is adjusted to the proper insolubility point to form a metal hydroxide. This leads to out of compliance effluent limits even when treated with conventional coagulation/flocculation.

To reduce these chelated metals, they need to be precipitated. A measure of their oxidative state is an indication of the amount of metals that are soluble. By using an ORP probe and controller, the amount of metals can be quantified and a graph generated. The graph shows the dosage of the metal precipitate (IE 060 or IE-061) versus the metals still in solution (ppm) as well as the milli-volt reading from the ORP meter. As more precipitant is added, the mV reading drops as well as the concentration of the metals in solution. A graph is generated in the form of a curve and will show an asymptotic leveling off as more precipitate added does not change the mV reading. This is the endpoint of treatment.

Setting up an automated control system is straightforward. Perform the bench scale testing to determine the ORP/dosage/metal concentration in ppm curve and then use this full scale for the waste stream. The equipment needed is an ORP meter/probe and a chemical pump for the precipitant. Once the set point is programmed into the controller, the effluent metal quality is automatically controlled.

For more information or details about system control or automation, call Integrated Engineers (559) 683-8284.