



# NORTH METAL & CHEMICAL COMPANY

World Class Molybdenum & Tungsten Compounds

Since 1921

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## Technical Information Bulletin

## Molybdenum Removal Procedure

**Scope:** The following procedure can be used to remove or minimize the amount of molybdenum contained in water or waste water discharge systems.

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### Step 1:

The first step is to render soluble molybdate in a discharge insoluble. This can be accomplished by the addition of ferric sulfate solution at a pH of <4. At this low pH, the two compounds react in water to form insoluble ferric molybdate together with soluble sodium sulfate. The amount of ferric sulfate to be added is dependant on the amount of molybdate present, but a rough ratio of three (3) parts ferric sulfate should be added for each two (2) parts of molybdate or one (1) part molybdenum. A slight excess should also be added at this point which will be transformed to ferric hydroxide (mostly soluble at these low pH levels).

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### Step 2:

Although the ferric molybdate is insoluble, it will usually be held in a colloidal suspension. To force it to drop out, raise the pH to 7-8 though the addition of lime. If an excess of ferric sulfate was added in the first step, raising the pH will render the residual ferric hydroxide insoluble. The insoluble ferric hydroxide will in turn flocculate out and settle to the bottom of the container, carrying the ferric molybdate with it.

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### Step 3:

At this point the supernatant liquid should be virtually clear, with all molybdate being held in the flocculated sludge. The clear liquid can be discharged, the sludge treated to improve filtering characteristics and then run through a filter press. The press discharge can go to the municipal sewer, the dewatered (possibly dried) sludge will have to go to a landfill. Ferric molybdate and ferric hydroxide are insoluble and would not contribute to any toxicity profile under current sanitary landfill restrictions.

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