

PRETREATMENT CORNER

AQUATIC TOXICITY

By Judy F. Musselman

Metal finishing operations may periodically have metal removal problems with their wastewater pretreatment facilities and often look to chemical suppliers for the answers. It is important that the pretreatment coordinator be aware of any changes to the industrial treatment operation and any changes that may occur in the industrial wastewater characteristics. While the pretreatment coordinator is not in a position to offer recommendations, pretreatment methodologies should be scrutinized, in particular, the chemicals that are proposed to be used for such treatment problems.

One such case that was recently encountered involves a metal finisher pretreating its wastewater to remove zinc. It was determined that one of the cleaners used for metal preparation prior to the galvanizing operation contains a chelating agent, which binds the metals in solution and therefore inhibits the metals from precipitating out of solution. A chemical supplier suggested the use of a wonder-chemical, that, unfortunately, contained sodium dimethyldithiocarbamate. While this chemical precipitant make work wonders and remove the metals effectively, if not used properly, the dithiocarbamate compounds may remain in solution and may be discharged to the public sewer system.

Sodium dimethyldithiocarbamate (DTC) is toxic to aquatic life and can combine with, or break down, to form other toxic chemicals, including Thiram and Ziram, both EPA registered fungicides, as well as other dithiocarbamates, carbon disulfide and dimethylamine. Some of these compounds may cause biological inhibition at the POTW wastewater treatment plant, and ultimately pass through to the receiving stream, causing further toxicity to the aquatic life in the receiving stream.

EPA has circulated a memorandum on this chemical as an alert to the potential problems that may occur if this chemical or similar chemicals are not used in proper dosages. This memorandum can be viewed at the following URL: www.epa.gov/r5water/npdestek/Diram8jmp.htm.

EPA discusses the use of DTC in the preamble of the proposed Metal Products and Machinery (MP&M) Effluent Guidelines published in the January 3, 2001 *Federal Register*, and while recognizing the effective use of DTC in treating chelated wastewaters, also points out the aquatic toxicity effects of the chemical and the potential toxic chemicals that may be formed if DTC is overdosed. Requirements for organic pollutant management plans also include procedures to prevent the overdosing of DTC when treating chelated wastewaters. EPA mentions in the proposed MP&M rule that it is considering adding dithiocarbamates and carbon disulfide to the list of regulated parameters under this effluent guideline, pending receipt of additional data and information.

In addition to the use of dithiocarbamates for the removal of metals in chelated wastewaters, these compounds may also be present in biocides used in the treatment of boiler and cooling tower waters. The blowdown and condensate from these sources may contain traces of these toxic chemicals and are often discharged to the public sewer system, depending on the municipality's local regulations governing these types of discharges.

Therefore, it is wise to review the industrial discharger's MSDSs to determine if this or any other toxic chemicals have the potential to be discharged to the public sewer system. Has the POTW failed any whole effluent toxicity tests lately? This class of chemicals could very well contribute to that toxicity problem.