Appendix H: Mercury Waste RCRA Categories

Source: Federal Register, May 28, 1999 (Volume 64, Number 103, pages 28949-28963)

D009 Wastes--Characteristic Mercury Wastes. D009 wastes are extremely variable in composition, and depend on the industry and process that generate the waste. Some of the more common types of D009 wastes include miscellaneous wastes from chlor-alkali production facilities (especially cell room trench sludge and activated carbon for liquid or gas purification), used fluorescent lamps, batteries, switches, and thermometers. D009 wastes are also generated in the production of organomercury compounds for fungicide/bactericide and pharmaceutical uses, and during organic chemicals manufacturing where mercuric chloride catalyst is used.[1]

Mercury concentrations within D009 wastes may range from 0.20 mg/L TCLP [toxicity characteristic leachate procedure] to greater than 75 percent of the total waste composition. D009 wastes may also contain organic compounds, usually when mixed with solvent wastes.

Although characterization data for D009 wastes are limited, some conclusions can be made regarding potential treatment concerns. Wastes with greater than 500 ppm 40 CFR part 261, appendix VIII organics (such as benzene) may be problematic for commercial retorting facilities due to the permitting requirements for boiler and industrial furnaces (BIF) (40 CFR 266.100(c)). At least two facilities are unable to handle wastes with these levels of volatile organics due to the additional permitting that would be required. However, these two facilities are capable of treating non-volatile activated carbons.

K071 Wastes--Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used. K071 wastes are generated by the chlor-alkali industry in the mercury cell process. In this process, sodium chloride is dissolved to form a saturated brine solution. The brine solution is purified by precipitation, using hydroxides, carbonates, or sulfates. The precipitate is dewatered to form K071 wastes, while the purified brine continues in the process. The depleted solution from the mercury cell is ultimately recycled to the initial step of the process.

Available analytical information for K071 brine purification muds show that these wastes consist primarily of inorganic solids and water. The normal total mercury content of K071 wastes is less than 100 parts per million (ppm) and is normally characterized as metallic mercury or soluble mercuric chloride.[2] Mercury from K071 wastes is typically recovered using a wet process, reflecting the BDAT for this waste.

K106 Wastes--Wastewater treatment sludge from the mercury cell process in chlorine production. Like K071 wastes, K106 wastes are generated from chlorine production using the mercury cell process. Effluent from the mercury cell includes spent brine, a portion of which is recycled and a portion of which is purged to wastewater treatment. Other plant area wastewaters (e.g., stormwater, washdown waters) are also typically sent to this treatment system. The wastewater treatment process generates a sludge through precipitation and filtering, which is K106 waste. Sulfides (as either sodium sulfide, Na2S, and/or sodium bisulfide, NaHS) have been commonly used as a precipitation agent for at least the last 10 years (1988 to 1998), according to data from the Chlorine Institute. Sludges generated in this manner are comprised, in part, of mercuric sulfide. Other (minor) precipitation agents result in the formation of mercury hydroxide or in elemental mercury. However, sulfide precipitation is preferable to hydroxide precipitation using hydrazine because mercury hydroxide is susceptible to matrix dissolution over a wide range of pH under oxidizing conditions.

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[1] U.S. EPA, 1989, pages 2-8.

[2] U.S. EPA, 1989, pages 2-11.

Available analytical information for K106 wastes indicates they are primarily composed of water and diatomaceous earth filter aid. This is true for K106 wastes generated by both sulfide treatment and hydrazine treatment. K106 wastes from sulfide precipitation contain approximately 4.4 percent mercury, as mercuric sulfide, while K106 wastes from hydrazine treatment contain approximately 0.5 percent mercury, as mercurous hydroxide.[3]

The mercury concentration in K106 waste is consistently greater than 260 mg/kg and therefore retorting is a required technology for this waste. K106 waste also contains significant levels of sulfides sulfates, sodium chloride, and organics, although the mercury is likely in an elemental or a sulfide form.

P065 Wastes--Mercury fulminate. P065 wastes consist of discarded mercury fulminate product, off-specification mercury fulminate product, and container or spill residues thereof. No waste characterization data were available for P065 listed wastes. The quantity of P065 waste is expected to have declined, as the military has phased out its use in explosives.[4]

P092 Wastes--Phenylmercury acetate. P092 wastes consist of discarded phenylmercury acetate product, off-specification phenylmercury acetate product, and container or spill residues thereof. There are very little data available on the composition of P092 listed wastes. The primary constituent of P092 listed wastes is phenylmercury acetate; organic constituents (in particular, benzene) are also expected to be present.[5] The use of phenylmercury acetate as a preservative in latex paint was phased out in 1991. Thus, the quantity of P092 waste is expected to decline dramatically as the stock of mercury-bearing paint is depleted.[6]

U151 Wastes--Mercury. U151 wastes consist of discarded elemental mercury product, off-specification metallic mercury product, and container or spill residues thereof. The majority of U151 wastes reported as a single waste code (i.e., not mixed with other listed or characteristic wastes) in the EPA 1986 Generator Survey are over 50 percent mercury. The principal constituent of U151 is metallic mercury.[7]

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[3] USEPA, 1989, pages 2-11.

[4] Kearney, 1997, page 1.

[5] USEPA, 1989, pages 2-17.

[6] Kearney, 1997, page 1.

[7] USEPA, 1989, pages 2-17.