TWO MINUTE TRAINING

TO: *CH2M HILL PLATEAU REMEDIATION COMPANY*

FROM: *PAUL W. MARTIN, RCRA Subject Matter Expert*
CHPRC Environmental Protection, Hanford, WA

SUBJECT: *AQUEOUS SOLUTIONS AND THE CHARACTERISTIC OF CORROSIVITY*

DATE: *JULY 2, 2020*

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TWO MINUTE TRAINING

SUBJECT: Aqueous Solutions and the Characteristic of Corrosivity

Q: A customer has an acidic wastestream that contains 15% water by volume. The customer believes that the wastestream is aqueous and uses an electronic device to measure pH. The device indicates that the wastestream has a pH of 3.0 and the customer designates the wastestream as nonregulated, i.e., not a D002 corrosive characteristic waste. Has the customer properly designated this wastestream?

A: WAC 173-303-090(6)(a)(i) [*40 CFR 261.22*] states that the characteristic of corrosivity for aqueous waste is determined via SW-846 Test Method 9040C, "pH Electrometric Measurement". SW-846 states that Method 9040C "is used to measure the pH of aqueous wastes and those multiphase wastes where the aqueous phase constitutes at least 20% of the total volume of wastes."

The customer's waste is 15% water and does not meet the definition of "aqueous" in terms of the characteristic of corrosivity for aqueous wastes per Method 9040C. Since the customer's waste is nonaqueous, it is not amendable to electrometric pH measurement via Method 9040C. Therefore, the customer may not have properly designated the waste. The more appropriate corrosivity test would be to determine if this liquid, as opposed to aqueous wastestream, corrodes steel at greater than ¼-inch per year. See WAC 173-303-090(6)(a)(ii).

Note that the use of an improper test method does not necessarily mean that the material will designate as a D002 corrosive waste. The use of Method 9040C on a nonaqueous waste just means that the actual pH of the acid wastestream has not been properly determined. Also, note that the customer could still apply process knowledge to determine the regulatory status of this wastestream.

SUMMARY:

- The characteristic of corrosivity for aqueous wastes is determined via Method 9040C.
- An aqueous waste is a form amenable to pH measurement.
- A waste amendable to pH measurement must contain at least 20% water by volume.

Excerpts from WAC 173-303-090(6), 40 CFR 261.22, SW-846, Method 9040C, and an EPA memo dated April 23, 1993 (RO 11738), are attached. If you have any questions, please contact me at Paul_W_Martin@rl.gov or at (509) 376-6620.

TWO MINUTE TRAINING – ATTACHMENT

SUBJECT: Aqueous Solutions and the Characteristic of Corrosivity

WAC 173-303-090(6) Characteristic of corrosivity.

(a) A solid waste exhibits the characteristic of corrosivity if a representative sample of the waste has any one or more of the following properties:

(i) It is aqueous and has a pH less than or equal to 2, or greater than or equal to 12.5, as determined by a pH meter using Method 9040C in "*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*," EPA Publication SW-846, as incorporated by reference in WAC 173-303-110 (3)(a);

(ii) It is liquid and corrodes steel (SAE 1020) at a rate greater than 0.250 inch (6.35 mm) per year at a test temperature of 55 degrees C (130 degrees F) as determined by the test method specified in NACE (National Association of Corrosion Engineers) Standard TM0169-2000 as standardized in "*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*," (Method 1110A) EPA Publication SW-846, as incorporated by reference in WAC 173-303-110 (3)(a); or

(iii) It is solid or semisolid which, upon testing using Method 9045D in "*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*" (SW 846), results in a pH less than or equal to 2, or greater than or equal to 12.5.

(b) A solid waste that exhibits the characteristic of corrosivity because:

(i) It has either of the properties described in (a)(i) or (ii) of this subsection will be designated DW, and assigned the dangerous waste number of D002;

(ii) It only has the property described in (a)(iii) of this subsection will be designated DW, and assigned the dangerous waste number of WSC2.

40 CFR §261.22 Characteristic of corrosivity

(a) A solid waste exhibits the characteristic of corrosivity if a representative sample of the waste has either of the following properties:

(1) It is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5, as determined by a pH meter using Method 9040C in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in §260.11 of this chapter.

(2) It is a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55 °C (130 °F) as determined by Method 1110A in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, and as incorporated by reference in §260.11 of this chapter.

(b) A solid waste that exhibits the characteristic of corrosivity has the EPA Hazardous Waste Number of D002.

SW-846 METHOD 9040C - pH ELECTROMETRIC MEASUREMENT

1.1 This method is used to measure the pH of aqueous wastes and those multiphase wastes where the aqueous phase constitutes at least 20% of the total volume of the waste.

1.2 The corrosivity of concentrated acids and bases, or of concentrated acids and bases mixed with inert substances, cannot be measured. The pH measurement requires some water content.

TWO MINUTE TRAINING – ATTACHMENT

SUBJECT: Aqueous Solutions and the Characteristic of Corrosivity

Faxback 11738 9443.1993(05)

United States Environmental Protection Agency
Washington, D.C. 20460
Office of Solid Waste and Emergency Response

MEMORANDUM April 23, 1993

SUBJECT: Interpretation of "Aqueous" as Applied to the Corrosivity Characteristic (40 CFR 261.22)

TO: Joseph R. Franzmathes, Director Waste Management Division

FROM: David Bussard, Director Characterization and Assessment Division

This memorandum responds to your memorandum to Bruce Diamond dated March 11, 1993 requesting clarification of the term "aqueous" as it applies to the corrosivity characteristic. Your memorandum references a September 1992 "Hotline Questions and Answers" publication produced by the RCRA/Superfund Hotline contractors and concurred upon by my Division and by OSW.

The Hotline publication correctly defines "aqueous," for the purposes of the corrosivity characteristic, to mean in a form amenable to pH measurement. This interpretation is consistent with the supporting documentation found in the background document for the corrosivity characteristic final rulemaking (Background Document: Section 261.22 - Characteristic of Corrosivity, May 2, 1980). I have attached the applicable section for your information.

A more specific interpretation of "aqueous" for the purpose of the corrosivity characteristic may be found in the method referenced in the actual regulatory text for the corrosivity characteristic at 40 CFR 261.22(a)(1). The regulation states that "[the EPA test method for pH is specified as Method 5.2, in "Test Methods for the Evaluation "of Solid Waste, Physical/Chemical Methods" (see attachment). Method 5.2, pH Electrometric Measurement, which was renumbered to Method 9040 specifies under scope and application that the method "is used to measure the pH of aqueous wastes and those wastes where the aqueous phase constitutes at least 20% of the total volume of "waste." Therefore, any waste for which this method is applicable must contain at least 20% free water by volume. This method is also attached for your information.

If you or your staff should have any questions regarding this memorandum, please call me or have your staff call Al Collins, of my staff, at 202-260-4791.