



AQUEOUS TECHNOLOGIES CORPORATION

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Federal Hazardous Waste Regulations Ion Exchange Resins

Under the federal regulations, determining whether a material is a hazardous waste is a two-step process. First, determine whether the material meets the definition of "solid waste." If material is not a "solid waste," it cannot be a "hazardous waste." When a material is a "solid waste," a second determination must be made for hazardous character and/or listing.

Step 1:

Defining Solid Waste

The definition of "solid waste" appears in the code of federal regulation at 40 CFR 261.2 (a)(1). "Solid waste" is defined as any *discarded* material. When ion exchange resin is discarded, it meets the definition of "solid waste." The definition is more complicated when the material in question is to be recycled. Some materials that are to be recycled are considered to be "solid waste;" others are not.

Materials are broken down into five categories: (1) spent materials (2) sludges (3) by-products (4) commercial chemical products and (5) scrap metals.

Definitions of each class appear at 40 CFR 261.2 and are critical to determining whether a particular material is regulated as "solid waste." Ion exchange resins are usually under the category of sludge.

Defining Sludge

A "sludge" is any solid semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility..." 40 CFR 260.10.

Although ion exchange resins do not appear sludge-like, they are typically used to treat either supply water or wastewater. The US EPA and various state environmental agencies have consistently concluded that used ion exchange resins are "sludges."

To determine whether sludge that is being recycled is solid waste, it is necessary to refer to Table 1. Two types of sludges are seen: sludges that are listed as a hazardous waste in the regulations and sludges that exhibit a characteristic of hazardous waste (i.e. composition, corrosivity, toxicity, reactivity, and ignitability).



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Table 1:

	Use Constituting Disposal §261.2(c)(1)	Energy Recovery Fuel §261.2(c)(2)	Reclamation §261.2(c)(3)	Speculative Accumulation §261.2(c)(4)
Spent Materials	(*)	(*)	(*)	(*)
Sludges (listed in 40 CFR Part 261.31 or 261.32)	(*)	(*)	(*)	(*)
Sludges exhibiting a characteristic of hazardous waste	(*)	(*)	(*)
By-Products (listed in 40 CFR Part 261.31 or 261.32)	(*)	(*)	(*)	(*)
By-Products exhibiting a characteristic of hazardous waste	(*)	(*)	(*)
Commercial Chemical Products listed in 40 CFR 261.33	(*)	(*)
Scrap Metal	(*)	(*)	(*)	(*)

Note: The terms "spent materials," "sludges", "by-products", and "scrap metal" are defined in 261.1. *Materials noted with a "(*)" in column 3 of Table 1 are solid wastes when reclaimed. 40 CFR 261.2(b)(3).

Recycling

A material is recycled if it is used, reused, or reclaimed. CFR 261.1(c)(7).

Whether a material being recycled is considered a solid waste also depends on how it will be recycled. The table contemplates four types of recycling:

1. Use constituting disposal (i.e. application to the ground, such as waste oil as a dust suppressant).
2. Burning for energy recovery.
3. Reclamation.
4. Speculative accumulation (i.e. storing for periods of over a year, generally to play the metals market).

For our purposes, the most important definition is that for "reclamation".

A material is "reclaimed" if it is processed to recover a usable product or if it is regenerated 40 CFR 261.1(c)(4). Ion exchange resins that are recycled are being regenerated and thus "reclaimed" within the definition of the regulations.

By referencing the table, sludges listed as hazardous waste are considered to be a solid waste when reclaimed. Ion exchanged resins used in electroplating operations are solid wastes because they are listed sludges (F006) bound for reclamation. Also by reference to the table, sludges that are characteristic are not solid waste when reclaimed.



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Step 2:

Determination of Hazardous Waste

When a material is first determined to be a solid waste, the second step must be taken to determine whether the solid waste is a hazardous waste. Solid waste that are listed are automatically hazardous. Solid wastes that meet certain compositions or characteristics for corrosivity, toxicity, reactivity, and ignitability are considered hazardous by characteristic.

If solid wastes do not meet the listing or characteristics tests they are not hazardous.

Conclusion

1. Ion exchange resins that are discarded are solid wastes. If they do not meet the listing or characteristic tests, they are not hazardous. If any of these tests are met the resins are considered hazardous. Determination of listing or characteristic is the responsibility of the generator.
2. Ion exchange resins used in electroplating operations are solid wastes because they are listed sludges bound for reclamation. They are hazardous wastes because they are solid wastes which are listed under waste code F006.
3. In other non-listed applications, ion exchange resins that are being reclaimed are not hazardous waste. This is because characteristic sludges bound for reclamation are not considered to be "solid wastes" and this cannot be hazardous wastes.

Sludges that are neither listed nor characteristic are not hazardous waste under any circumstances.