REV 0421

Plating Waste, Cyanide Complexes

Mixed plating waste rinse waters contain metals present as either the free metallic cation or the anionic cyanide complex. The metals may be removed by either the cation or anion resins, the metal ions being easy to remove when present as free cation. The cyanide complexes of the metals, which are anionic in nature, are removed quite readily by anion resins. Most anion resins have very high selectivities for these complexes.

These complexes are not easy to remove from the anion resin during regeneration. A two step procedure is required. First the anion resin (ResinTech SBG1 or SBG2) is rinsed with sulfuric acid to break the cyanide complex then the resin is regenerated as normal with caustic. If the waste treatment operation is using a two-bed cation and anion exchange system, the waste acids from the cation exchanger can be used for the acid in the two-step anion exchanger regeneration.

This treatment scheme features concentration of the metallic wastes which can facilitate disposal, but does not usually recover the metals for re-use. The effluent water from the system is deionized and can be looped back to the rinse tanks.

Capacity of ResinTech SBG1 for metallic cyanide complexes

METAL	COMPLEX	CAPACITY IN GRAMS OF METAL PER GRAM OF SBG1
Gold	$Au(CN)_2^{-1}$	0.7
Silver	$Ag(CN)_2^{-1}$	0.3
Copper	$Cu(CN)_4^{-3}$	0.08
Iron	$Fe(CN)_6^{-4}$	0.05
Cobalt	$Co(CN)_6^{-3}$	0.08
Nickel	$Ni(CN)_4^{-2}$	0.1
Zinc	$Zn(CN)_5^{-3}$	0.08

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INNOVATIONS IN ION EXCHANGE

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