Sorbster

Ecologically Effective Contaminants Adsorption

High Concentration Boron Removal by Sorbster[®] Media

Boron in FGD Wastewaters

Boron levels in flue gas desulfurization scrubber (FGD) wastewaters typically exist at ppm (mg/L) levels and often exceed 200 ppm. Boron is a nonmetallic element that occurs in industrial waters primarily in two forms: as nonionized boric acid and at pH >11 as the borate ion. pH's from 7.5 to 10.5 represent a mixture of both the acid and borate forms. RO, anion exchange and adsorbents are the current accepted removal technologies. The ionic character of the borate form and a long contact time are desirable for bonding to adsorbents. The removal of boron by Sorbster[®] adsorbent media was demonstrated in FGD and power plant leachate waters all containing ppm levels of boron.

Flow-Through Column Results on Field Waters

Sorbster provides comprehensive removal evaluation for client waters in dynamic flow-through columns of Sorbster[®] Media for extended bed volumes of treatment. Sorbster[®] media was applied to eleven different power station waters for boron removal. At the high levels of boron, removal is small at a 25 minute contact time but when the contact time is increased in a fill-hold-drain application approach, a significant increase in boron removal is achieved. Sorbster[®] media can attain 50 - 60% and higher boron removal rates when applied for a 150 minute (2.5 hour) water-to-media contact time.

Sorbster [®] Media – The Benefit of Longer Water-To-Media Contact Time for Boron								
Removal at High Boron Concentrations								
Power	Water	рН	Initial	Sorbster®	%	Sorbster®	%	% Removal
Station	Туре		Boron,	Treated	Removal	Treated	Removal	Increase
			ppm	Boron @ 25		Boron @ 2.5		with
				Min CT,		Hour CT,		Longer
				ppm		ppm		Contact
								Time
1	FGD	8.8	88	84	5%	34	61%	+56%
2	FGD	9.2	510	480	6%	210	59%	+53%
3	FGD	7.4	232	225	3%	100	57%	+54%
4	FGD	8.4	302	272	10%	140	54%	+44%
5	FGD	7.3	180	154	14%	57	68%	+54%
6	FGD	8.6	334	316	5%	Not tested	-	-
7	FGD	7.1	379	332	7%	Not tested	-	-
8	FGD	7.6	225	200	11%	60	73%	+62%
9	Leachate	9.6	9	7	22%	3.5	61%	+54%
10	Leachate	10.5	40	33	18%	8	80%	+62%
11	Leachate		22	17	23%	Not tested	-	-



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High Concentration Boron Removal by Sorbster[®] Media as a Function of Contact Time for FGD Waters

Summary

- Sorbster[®] media removes ppm levels of boron from wastewaters
- Removal is a function of water-to-media contact time
- A fill-hold-drain application with long contact time is recommended for maximum removal
- Multiple beds can be applied to increase contact time
- Expected removal at 150 minute contact time is 60%