PRODUCT DATA SHEET

AMBERLITE™ IRN217

Industrial Nuclear Grade Mixed Bed Resin

AMBERLITE IRN217 resin is a mixture of uniform particle size gelular polystyrene cation and anion exchange resins. AMBERLITE IRN217 resin as supplied contains a stoichiometric equivalent of the strongly acidic cation resin, fully converted in the 7 Lithium form, and the strongly basic anion exchange resins. It is supplied in the Li^+/OH^- form. AMBERLITE IRN217 resin is designed for use in primary water chemistry control in PWR nuclear power operations. Only LiOH of certified isotopic purity greater than 99.9 % 7 Li is used in manufacturing the cation component of AMBERLITE IRN217 resin. The resin combines the properties of high capacity and excellent resistance to bead fracture from attrition and osmotic shock.

PROPERTIES

Physical form	Uniform particle size spherical beads	
Matrix	Styrene divinylbenzene copolymer	
Shipping weight	690 g/L	
	Cation resin	**Anion resin**
Functional group	Sulphonic acid	Trimethylammonium
Ionic form as shipped	$^7Li^+$	OH^-
Total exchange capacity [1]	≥ 1.75 eq/L ($^7Li^+$ form)	≥ 1.2 eq/L (OH^- form)
Strong base capacity [2]	-	≥ 90 %
Moisture holding capacity [2]	49 -55 % (H^+ form)	54 - 60 % (OH^- form)
Particle size		
Uniformity coefficient	≤ 1.2 (for each component)	
Harmonic mean size	0.650 ± 0.05 mm	0.630 ± 0.05 mm
< 0.300 mm	0.2 % max	
Whole beads	98 % minimum	
Ionic conversion [2]	99 % min $7Li^+$	95 % min OH^- [2]
$CO_3^=$	-	5 % max
Cl^-	-	0.1 % max
$SO_4^=$	-	0.1 % max

[1] *Average value calculated from statistical quality control*
[2] *Contractual value*
Test methods and SQC charts are available on request.

RECOMMENDED OPERATING CONDITIONS

Maximum operating temperature	60 °C
Minimum bed depth	800 mm
Service flow rate	8 to 50 BV*/h
Service velocity	60 m/h maximum

** 1 BV (Bed Volume) = 1 m^3 solution per m^3 resin*

PURITY

AMBERLITE IRN217 resin is designated as a nuclear grade resin and is manufactured using special processing procedures. These procedures, combined with a Rohm and Haas process to reduce the chloride content of the anion component, produce material of the ultimate purity and yield a product meeting the exacting demands of the nuclear industry.

AMBERLITE IRN217 resin is recommended in any non regenerable mixed bed application where reliable production of the highest quality water is required and where the "as supplied" resin must have an absolute minimum of ionic and non ionic contamination.

Purity	Cation	Anion
	mg/kg dry resin	
Al	≤ 50	≤ 50
Ca	≤ 50	≤ 50
Co	≤ 30	≤ 30
Cu	≤ 10	≤ 10
Fe	≤ 50	≤ 50
Hg	≤ 20	≤ 20
K	≤ 40	≤ 40
Mg	≤ 50	≤ 50
Na	≤ 50	≤ 20
Pb	≤ 10	≤ 10
Total Cl		≤ 500
SiO_2		≤ 100
Total SO_4		≤ 600

APPLICATIONS

AMBERLITE IRN217 resinis specifically designed for mixed beds for purification in the chemical and volumetric control system of pressurised water reactors. This application requires the mixed bed to remove radio-isotopes such as 137 Cesium, 58 Cobalt and 131 Iodine, and also chemical contaminants such as Cl and SO_4. Since the primary reactor coolant contains relatively high background levels of boric acid buffered with 7LiOH, the mixed bed resins will operate in the 7Li/Borate form.

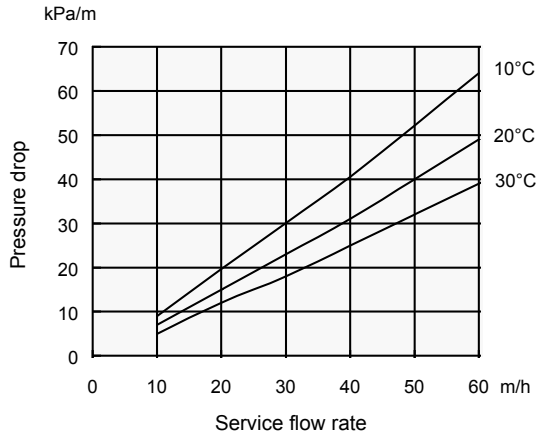
The cation resin component of AMBERLITE IRN217 resin is supplied in the 7 Lithium form in order to minimise fluctuations in the concentration in 7 Li in the reactor coolant, when a new purification mixed bed is put into service. AMBERLITE IRN217 is made only using certified isotopically pure 7LiOH in order to minimise the undesirable reaction **6Li+n->3H+@.**

The anion resin component of AMBERLITE IRN217 resin is very highly regenerated to the hydroxide form to insure that less than 0.1 equivalent percent of the sites on the resin are in the chloride form and 0.1 percent equivalent in the sulphate form. Therefore, AMBERLITE IRN217 resin can effectively control chloride and sulphate impurities while operating in a 7Li/Borate solution.

HYDRAULIC CHARACTERISTICS

The approximate pressure drop for each meter of bed depth of AMBERLITE IRN217 resin in normal downflow operation at various temperatures and flow rates is shown in the graph below.

Figure 1 : Pressure drop



RESIN HANDLING

To retain the high purity standards of nuclear grade resins, deionised water should be used for all resin handling. Contact of the resin with air should also be minimised to avoid CO_2 pickup and subsequent loss of capacity of the anion resin.

All our products are manufactured in ISO 9001 certified facilities.

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