Tender no: PUR/2/50/100689/1271
Item : Ion Exchange Resin

M A T E R I A L D E T A I L S

ION EXCHANGE RESIN. (FOR JADUGUDA MILL)

DUTY CONDITION:

Strongly basic ammonical Anion Exchange Resin is required for the selective adsorption of Anionic Uranyl Sulphate complex from the clarified pregnant liquor obtained by Sulphuric Acid leaching of uranium ore, for the purpose of purification and concentration. The adsorbed uranium complex must be subsequently eluted from the resin by split elution technique by acidic chloride eluent liquor (0.12N, 35 g/l chloride & Hydrogen peroxide: 0.1-0.25 g/l)) at sufficiently high concentration for the production of Uranium Peroxide by direct precipitation.

Other details are as follows:

1) Flow rate during adsorption : 400 to 700 litres / minute
2) Height of resin bed per column : 1.981 m
3) Surface area of resin bed : 3.577 m^2
4) Number of column during adsorption : Two
5) Flow of eluent liquor rate during elution : 265 to 285 l/min
6) pH of influent pregnant liquor : 1.5 to 1.8
7) Typical analysis of feed clarified pregnant liquor:

Turbidity	:	2 to 3 ppm
pH	:	1.7 to 1.8
U_3O_8	:	0.30 to 0.35 g/l
Fe^{++}	:	0.14 to 0.16 g/l
Fe^{+++}	:	1.0 to 1.1 g/l
Sulphate	:	12.5 to 13.0 g/l
Chloride	:	0.18 g/l
Copper	:	0.008 g/l
Mo	:	0.008 g/l
Ni	:	0.017 g/l
P_2O_5	:	0.25 g/l
Mn	:	1.1 to 1.2 g/l
SiO_2	:	0.61 g/l
Ca	:	0.45 g/l
Mg	:	0.55 g/l

8) Physical Characteristics:

a) Size Analysis:

Size (Tyler mesh)	Size (ASTM)	% by weight
+14	+16	Nil

Tender no: PUR/2/50/100689/1271
Item : Ion Exchange Resin

-14 +25	-16+25	9.8
-25 +35	-25+40	81.2
-35 +48	-40+ 50	8
-48	- 50	1

Maximum portion of bead should be in between -25 + 35 Tyler /-25 + 40 ASTM mesh.

b) Voids : 40%
c) Water remain (gms. water / gms. of dry resin) : 0.6 to 0.9
d) pH range : 1.5 to 2.0

9. Typical chemical characteristics of resin being used:

Total chloride capacity – M.Eq/Lit (wet settled resin)	:	1440
Strong base capacity M.Eq/Lit(W.S.R)	:	1437
Salt splitting capacity M.Eq./Lit (W.S.R)	:	1157
Dry weight capacity M.Eq./gms. Dry resin	:	3.8
Uranium capacity gms. U_3O_8 / Lit. (W.S.R)	:	68 or more.

MAKE/Brand: Ion Exchange, Indion ARU-104 / Dow Chemicals,Amberjet 4400 Cl / Purolite, Purofine PFA 600 / 4740.

Tender no: PUR/2/50/100689/1271
Item : Ion Exchange Resin

ION EXCHANGE RESIN (FOR TURAMDIH MILL)

A) DUTY CONDITION:

Strongly basic ammonical Anion Exchange Resin is required for the selective adsorption of Anionic Uranyl Sulphate complex from the clarified pregnant liquor obtained by Sulphuric Acid leaching of uranium ore, for the purpose of purification and concentration. The adsorbed uranium complex must be subsequently eluted from the resin by split elution technique by acidic chloride eluent liquor (0.12N, 35 g/l chloride & Hydrogen peroxide:0.1-0.2 g/l) at sufficiently high concentration for the production of Uranium peroxide by direct precipitation.

Other details are as follows:

1) Flow rate during adsorption : 850 to 1100 liters / minute
2) Height of resin bed per column : 2.150 m
3) Surface area of resin bed : 6.154 m^2
4) Number of column during adsorption : Two
5) Flow of eluent liquor rate during elution : 380 to 400 l/min
6) pH of influent pregnant liquor : 1.5 to 1.8
7) Typical analysis of feed clarified pregnant liquor

Turbidity	:	2 to 5 ppm
pH	:	1.75 to 1.87
U_3O_8	:	0.23 to 0.32 g/l
Fe^{++}	:	0.14 to 0.16 g/l
Fe^{+++}	:	1.0 to 1.15 g/l
Sulphate	:	12.5 to 13.0 g/l
Chloride	:	0.50 to 0.75 g/l
Copper	:	0.10 to 0.13 g/l
Mo	:	0.008 g/l
Ni	:	0.017 g/l
P_2O_5	:	0.15 to 0.18 g/l
Mn	:	0.65 to 0.8 g/l
SiO_2	:	0.80 - 0.95 g/l
Ca	:	0.65 to 0.75 g/l
Mg	:	0.3 to 0.4 g/l

B) PRODUCT REQUIREMENT:

Physical Characteristics:

a) Size Analysis

Size (Tyler mesh)	ASTM	% by weight
+14	+16	Nil
-14 +25	-16 + 25	9.8
-25 +35	-25 + 40	81.2
-35 +48	-40 + 50	8
-48	- 50	1

Tender no: PUR/2/50/100689/1271
Item : Ion Exchange Resin

Maximum portion of bead should be in between -25 +35 Tyler meshes or -25 + 40 ASTM.

b) Voids : 40%
c) Water remain (gms. water / gms. of dry resin) : 0.6 to 0.9
d) pH range : 1.5 to 2.0
e) Uranium loading capacity (g/l of WSR) : 70 or more
f) Uranium in barren liquor (effluent of 2nd column) : <1% of feed value at break point with 850 litres/ min. influent flow
g) Periodicity of regeneration (cycles) : After 18-23 cycles of elution
h) Limit of fines generation of less than 48 Tyler mesh size: Maximum 5% between each regeneration

C) EXTRA INFORMATION: Typical chemical characteristics of resin being used:

Total chloride capacity – M.Eq/Lit (wet settled resin)	:	1440
Strong base capacity M.Eq/Lit(W.S.R)	:	1437
Salt splitting capacity M.Eq./Lit (W.S.R)	:	1157
Dry weight capacity M.Eq./gms. Dry resin	:	3.8
Uranium capacity gms. U_3O_8 / Lit. (W.S.R)	:	Above 70

MAKE/Brand: Ion Exchange, Indion ARU-104 / Dow Chemicals,Amberjet 4400 Cl / Purolite, Purofine PFA 600 / 4740.