Waste Alkali Recovery in Ion Exchange Process

Overview

Alkali helps to clean the ion exchange resins in order to be reused in IE process, these alkali turns into waste after work. "Organic Tubular Membrane + NF membrane" systems can purify and recover the waste alkali.

Organic tubular membrane system can remove the SS particles and small molecule impurities of the waste alkali, secures NF system to have a desired flux, longer lifecycle. Then the permeate flows into NF system.

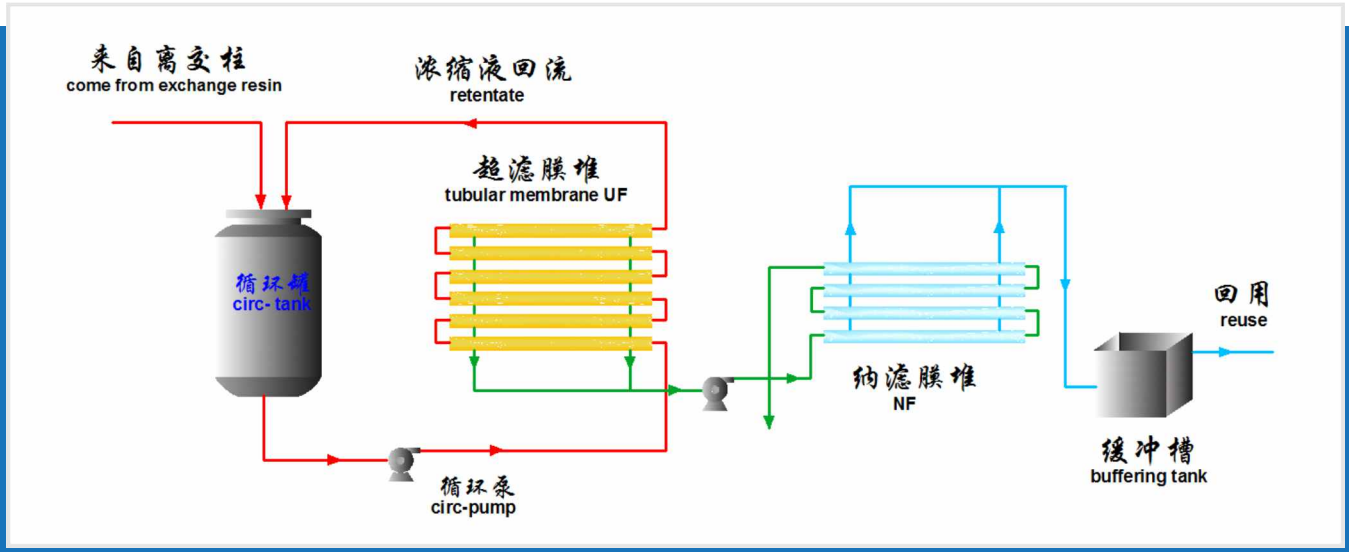
The system adopts KAIMI's braced membrane module, pH range tolerance 0-14, Max NaOH tolerance is 25%.

Project Brief

Project Location	*Hebei, China*
Treatment Capacity	*1,600m³/D*
Started at	*August of 2010*
Membrane Model	*KMTC-D-SD-0512*
Specification	*12.5mm PES, E30 TM*
Membrane Type	*Braced Membrane Module with 37 Channels*
Membrane Flux	*65LMH*
Membrane Per Set	*48pcs*
Component Distribution	*4×12/Set; total 5 sets*
Treatment Capacity Per Set	*16m³/H*

Project Overview

Tubular Membrane System



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Process Chracteristics

- Alkali concentration: 2 - 4%.
- Transmittance of mixed samples after treatment ⩾90%(measured about 470nm).
- Color of recovery alkali: colorless and clear (meet the recovery requirement).
- Tubular membrane system's recycle rate >90%; NF system's recycle rate is 83%.

Economic Benifits

Annually Savable Solid Alkali	
Alkali Concentration	2% - 4%
Recovery Alkali	1600m^3/day*90%*83%= 1195.2m^3/day
Savable Alkali	1195.2m^3/day*3%= 35.86m^3/day
Savable Solid Alkali	35.86m^3/day*1800RMB* 300day=19,364,400RMB/year
Annually Water Save	
Water Saving	1195.2m^3/day*97%= 1159.3 m^3/day
Value of Waste Saving	1159.3m^3/day*3RMB*300days= 1,043,400 RMB/year
Annually Cost Save: 20,407,800 RMB	

Equipment	
UF & NF Equipment	15,000,000 RMB
Power Consumption	
UF Equip Power	310KW
NF Equip Power	262KW
Electricity Cost	572KW*20h*1RMB* 300days=3,432,000RMB
Wages =450,000 RMB (3 shifts, 3 workers /each shift)	
TOTAL: 13,882,000 RMB	

The UF-NF systems help to get the repay of the investment in one year, also recover a large amount of NaOH and water. It optimizes resources allocation, makes benefits to environment and society.

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