

PRINYA YAMASAMIT : EFFECT PF COUNTER-CURRENT REGENERATION AT LOW  
FLOW RATE ON PERFORMANCE OF ION EXCHANGE RESIN PROCESS. THESIS  
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This research was performed to give a comparison between co-current and counter-current regeneration efficiency (without bed expansion prevention during counter-current regeneration). Three kinds of resin had been selected to be compared. They were strong acidic cationic resin in sodium-form and in hydrogen-form and strong basic anionic resin in hydroxide-form. Level of regeneration flow rate to be studied were 1,2 and 3 BV/hr.

Experimental results showed that the ion exchange capacity of counter-current regeneration in sodium-form was found to be 79-85% (average 82%) of co-current regeneration at the same flow rate, while in hydrogen-form and hydroxide form were found to be 84-93%(average 88%) and 65-103%(average 81%) of co-current at the same flow rate. Whereas the counter-current regeneration efficiency was the same.

In addition, the counter-current regeneration showed higher treated water quality when compared with the co-current regeneration. For example, hardness in the treated water produced by the sodium form resin regenerated counter-currently was approximately 0.20 mg/l  $\text{CaCO}_3$  which was 1/15-1/20 times of the treated water from the co-current regeneration, while the H-form resin regenerated counter-currently produced treated water having hardness and sodium of approximately 0.25 and 1.00 mg/l  $\text{CaCO}_3$  which were 1/2 and 1/5 times of the treated water from the co-current regeneration respectively, and the OH-form resin regenerated counter-currently produced treated water having chloride and conductivity of approximately 1 mg/l  $\text{CaCO}_3$  and 1.5 micromhos/cm which were 7/10 and 9/10 times of the treated water from the co-current regeneration.