

## C21638 : MAJOR SANITARY ENGINEERING.

KEY WORD : VERTICAL LOOP REACTOR/IRON REMOVAL.

SONGSORN KHEOSIPLARD : APPLICATIONS OF VERTICAL LOOP REACTOR FOR IRON REMOVAL. THESIS ADVISOR : ASSOCIATE PROFESSOR SURAPOL SAIPANICH., Ed.D. 329 pp. ISBN 974-581-513-6

In this experiment, the Vertical Loop Reactor was used to transform the Ferrous iron to Ferric iron. The Reactor was made from transparent plastic pipe with diameter 4.40 cm. in rectangular shape at 1.0 m. wide and 1.5 m. high. The total volume of the reactor was 9.45 litres.

Experiment consisted of two parts. Objective of the first part was to find a suitable range for the second part. Experiment in this stage was performed at pressure 0.50, and 1.00 bar, synthetic water flow rate at 20, 30, 40, 50 and 60 lit/h. and ferrous iron concentration at 0.25, 0.50, 0.75, 1.00, 1.25, 1.50, 1.75 and 2.00 mg/l. All experiment had been done with synthetic water approximately pH 7. Conclusion from this part was as follow. In determination of the ferrous iron removal efficiency, ferrous iron concentration must be greater than 1.0 mg/l. Then, the second part was performed at pressure 0.50 and 0.75 bar with synthetic water flow rate at 20, 40 and 60 lit/h. and ferrous iron concentration were 1.00, 1.50 and 2.00 mg/l. All experiment had been done with synthetic water appoximately pH 7.

Results revealed that vertical loop reactor could be applied for ferrous iron removal with efficiency of 60 to 90 percents. The general equation of this experiment could be written as follow :  $E = (3.575 P - 0.772) F + 103.99$  ;  $F > 2.12 P + 2.64$  where; E is ferrous iron removal efficiency by vertical loop reactor in %, P is pressure inside the reactor in bar and F is ferrous feed rate by mass per volume of reactor in mg/l-h. This equation can be applied when ferrous feed rate by mass per volume of reator equal or greater than  $2.12 P + 2.64$  mg/l-h.