

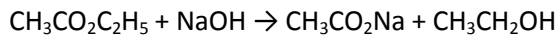
## Ethyl Acetate Kinetics

TO: Engineering Development Branch

FROM: Engineering Division

SUBJECT: Ethyl Acetate Kinetics

A design study for the new reactor for the ethyl-acetate/sodium hydroxide needs the kinetic parameters (rate constant, reaction order, activation energy) for the reaction.



Using the laboratory equipment, determine if the existing stirred-tank reactor (volume = 80 cubic meters) is large enough for to process the stream described below. Please determine the temperature at which this tank can achieve 96% conversion assuming the following feed conditions:

Et Ac feed-stream flowrate = 5300 moles Et Ac per day

Et Ac feed-stream concentration = 0.023 molar Et Ac

NaOH feed-stream flowrate = 7950 moles NaOH per day

NaOH feed-stream concentration = 0.046 M NaOH

Useful Reference:

Laidler, K.J. and Chen, D., Trans. Far. Soc., **54**, 1026, (1958).