

Ethyl Acetate Kinetics

Winter 2007

TO: Engineering Development Branch

FROM: Engineering Division

SUBJECT: Ethyl Acetate Kinetics

In our design study for the new reactor for the Ethyl-Acetate/Sodium Hydroxide Plant, we need to determine the kinetic parameters (rate constant, reaction order, activation energy) for the reaction.

We already have a stirred-tank reactor (volume = 80 cubic meters) on hand which was salvaged from the old polymers plant. Would you please determine if this tank would be an adequate reactor to achieve a 96 percent conversion of our ethyl-acetate under the following conditions:

Reaction temperature = 28 degrees centigrade

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).