

Memo 10

DIVERSIFIED CHEMICAL PRODUCTS**Specialty Products Division****Cambridge MA**

TO: U. R. Engineer
FROM: I. M. Subcontractor
DATE: 2007 Oct 7
SUBJECT: Lucretex Batch Process Development Project Description and Goals

Per your request I obtained the data you need for the economic analysis. Here are the results of my calculations:

- Reaction 1: The reaction time is 43,200 s, the maximal liquid volume 1.614 m^3 and the maximal cooling load in the condenser 34.9 kJ/s. At the end of the reaction the volume is 1.589 m^3 and the temperature 377.85 K.
- Reaction 2: The reaction takes 11,130 s. 3432.99 mols of methanol are needed for the reaction. The inlet volume is 1.652 m^3 and the outlet volume 1.595 m^3 .
- Distillation 1: The simulated distillation time (from moment of first draw until temperature constraint) is 19,198 s. The distillation overhead consists of 1677.3 mols methanol, 1761.26 mols R1, 6551.2 mols toluene, 5.96649 mols E and 3.60332 mols A.
- Distillation 2: The simulated distillation time (from moment of vacuum initiation until temperature constraint) is 9375.9 s. The distillation residue (bottom) consists of 0.06 mols active catalyst, 24.94 mols deactivated catalyst, 1.57272 mols I2, and 30.76 mols A.
- Reaction 3: The reaction time is 15,044 s and 52492 mols water are needed. The inlet volume is 1.698 m^3 and the outlet volume 1.868 m^3 .
- Distillation 3: The simulated distillation time (from moment of first draw until purity constraint) is 91,683 s. The distillation overhead (top) consists of 1539.8 mols methanol, 850.2 mols toluene, 219.9 mols E, 223.2 mols A, and 51722 mols water. The pot fulfills the purity specification with 769.9 mols D, 1947.1 mols A, and 87.1221 mols toluene.