
Individual Homework Problem Due Friday August 29, 2008

- **Problem 2-1**

Group assignment Project Problem #1 = flammable solvent schemes. (*see previous handout*)

Individual Homework Problem Due Wednesday September 3, 2008

- **Problem 2-6**

<p style="text-align: center;">ASSIGNMENT – Generation and Screening of Alternatives 100 Supplemental Project POINTS = DUE -- WEDNESDAY SEPTEMBER 3, 2008</p>
--

- Read Chapter 3 Process Design Development pages 67 → 121

As in assignment Project Problem #1 you should work in groups of up to three.

◇ Submit ONE report for the entire group.

Project Problem # 2.

- The research department has worked out a laboratory synthesis for the preparation of compound `E', in which 1 liter of methyl ethyl ketone, a solvent which does not participate in the reactions, is heated to boiling in a round-bottom flask equipped with a reflux condenser. Then 100 ml of organic liquid `A' is added to the flask. Then organic liquid `B' is added with agitation in two portions of 75 ml each. The reaction between `A' and `B' to produce `C' is rapid and slightly endothermic. The flask is then cooled to room temperature, and gas `D' is bubbled through the liquid under agitation. `E' is obtained as a precipitate. When the reaction, which is highly exothermic, ceases, the flask contents are filtered and then washed on the filter paper with methyl ethyl ketone. The wet solid is scraped off the filter paper into an evaporating dish and dried in a lab oven.
- a) Work out a preliminary, rough, process flow diagram for producing 1 metric ton/day (1 metric ton = 1,000 kg) of `E' as a dry crystalline solid.
 - b) The marketing department of your company completed a market survey for `E'. They believe that a market for 15,000 metric tons/year can be developed quickly. Prepare a preliminary, rough design based on the information available to you.

For each part above :

- State all assumptions.
- Prepare a material balance and size the reactor volume needed for your process scheme.
- List some of the additional information you would need to be able to proceed to a detailed process design.

ASSIGNMENT – Generation and Screening of Alternatives

100 Supplemental Project POINTS = DUE -- WEDNESDAY SEPTEMBER 3, 2008

As in Project Problem #2 above, you should work in groups of up to three.

◇ Submit ONE report for the entire group.

Project Problem # 3 - Creativity Problem :

An aluminum-titanium alloy that has all of the classic characteristics of conventional aluminum metals -- strength, durability, machinability, and electric conductivity -- but can be decomposed rapidly by cold water has been developed and is being marketed by T.A.F.A., a firm in Bow, New Hampshire. Away from the water the alloy is stable under a wide range of atmospheric conditions and has shown no sign of erosion or deterioration over long test periods, according to the firm.

How many ways can this alloy be put to use?
