

Chemistry 470 - "Industrial Chemistry"

Spring, 2012

Process Term Paper

Select a major organic commodity chemical (*not* including one of the principal petrochemical feedstocks, *i.e.*, methane, ethylene, propylene, benzene, toluene, xylenes, or a C₄ or C₅ hydrocarbon) or a large-volume downstream product. Periodicals such as *Chemical Week*, *Chemical & Engineering News*, and *Chemical Market Reporter* are good sources of ideas for topic chemicals.

Prepare a comprehensive report discussing all pertinent aspects of the process(es) used to manufacture this chemical.

Appropriate topics for discussion include (but are not necessarily limited to) the following:

- 1.) History of prior process(es), if any, for manufacturing the chemical, including a time line for the development of improved or larger volume processes.
- 2.) Thermodynamics of the reaction(s) used, and consequent limitations, if any, on process yields.
- 3.) Kinetics of the reaction(s) involved, including kinetic expressions, if available.
- 4.) Reactor designs used.
- 5.) Typical ranges of operating conditions (temperature, pressure, contact time, etc.) and reasons for their selection.
- 6.) Detailed description of the catalyst(s) used for the process(es), including promoters, supports, lifetime, susceptibility to deactivation, and nature of the "active sites" (if known).
- 7.) List of the pertinent patent(s) covering the process.
- 8.) Principal downstream demand or end uses for the chemical.

A minimum of six literature references should be used as sources in preparing the paper. Of these, no more than two may be un-refereed web sites. (On-line versions of technical journals are acceptable as refereed sources.) Note that Wikipedia should not be used as the sole on-line source for a topic, without corroboration from other sources. However, many Wikipedia articles, particularly those on technical subjects, include a list of references to primary literature, and can thus serve as good starting points for literature searches.

Total length of the paper is limited to no more than 15 double-spaced pages, not including the list of cited literature references and supplementary material such as Tables and Figures. Attach a copy of each literature source used. For book chapters, include a copy of the book's title/author and copyright pages.

Paper is due no later than **Monday, April 23rd**.

