

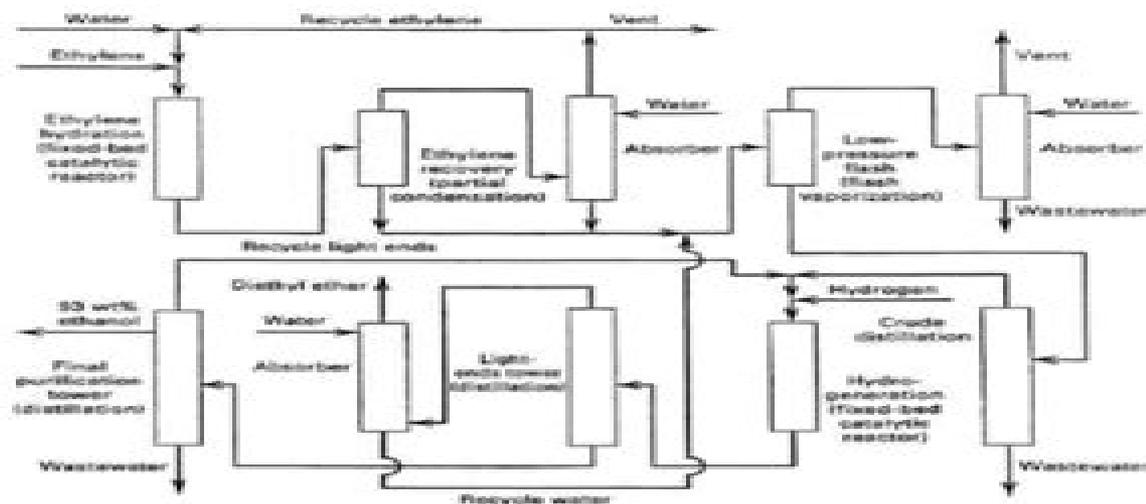
## Exercise 1.1

**Subject:** Separation operations in an ethanol process.

**Given:** Flow sheet for the process.

**Find:** Operation in each block of the process

**Analysis:** The flow sheet is as follows:



Starting from the left side of the top row, number the equipment blocks 1-5. On the next row, number them from right to left as 6-10.

1. The feed to the reactor contains ethylene, propylene, and water. The very incomplete reaction effluent of gas contains, in addition: ethyl alcohol, diethyl ether, acetaldehyde, and isopropyl alcohol.
2. Most of the chemicals, except most of the ethylene, are condensed and sent to item 4. The remaining gas is sent to 3.
3. The ethylene is recovered from the small quantity of other chemicals in the absorber. Most of the ethylene is recycled to 1. The water and other chemicals are sent to 4.
4. Remaining ethylene is flashed off and sent to 5. The liquid contains most of the hydrocarbons and is sent to 6.

# Separation Process Principles Solution Manual 3rd Edition

**Christie John Geankoplis, Allen  
Hersel, Daniel H. Lepek**



## **Separation Process Principles Solution Manual 3rd Edition:**

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complex chemical systems in order to relate the story of physical chemistry in an intellectually coherent manner The topics are organized to correspond with those typically given in each of a two course semester sequence The first 13 chapters present quantum mechanics and spectroscopy to describe and predict the structure of matter atoms molecules and solids Chapters 14 to 29 present statistical thermodynamics and kinetics and applies their principles to understanding equilibria chemical transformations macromolecular properties and supramolecular machines Each chapter of the book begins with a simplified view of a topic and evolves to more rigorous description in order to provide the student and instructor flexibility to choose the level of rigor and detail that suits them best The textbook treats important new directions in physical chemistry research including chapters on macromolecules principles of interfaces and films for organizing matter and supramolecular machines as well as including discussions of modern nanoscience spectroscopy and reaction dynamics throughout the text

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