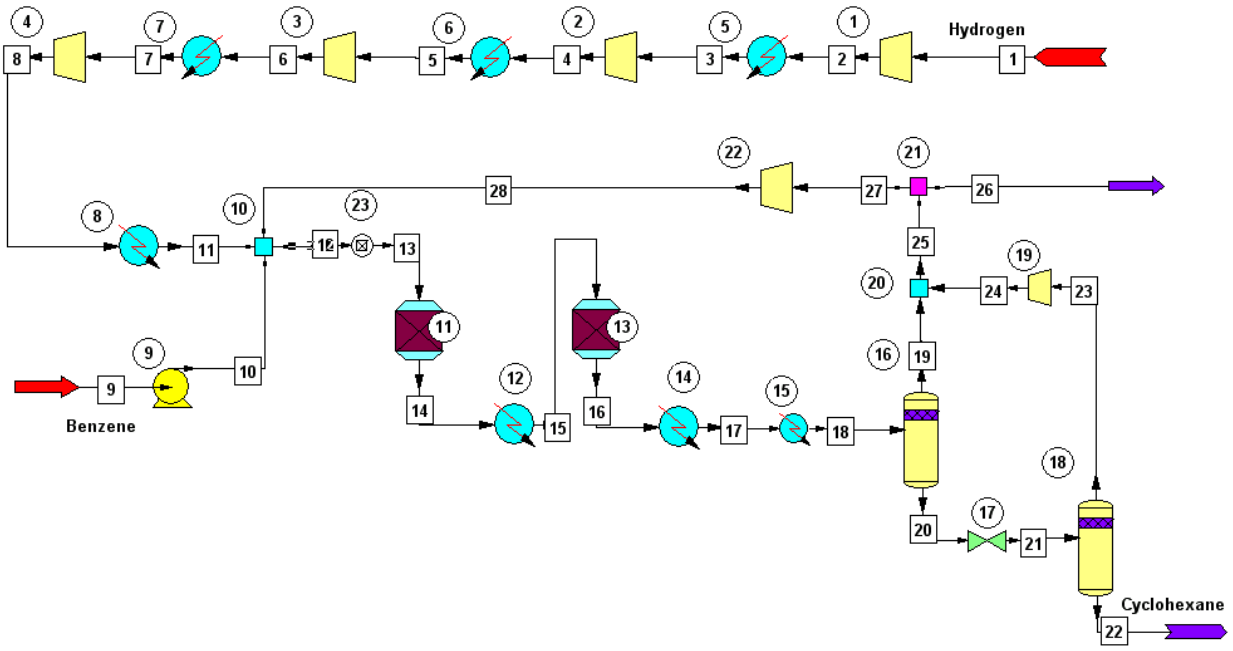
# Benzene Hydrogenation to Cyclohexane (32,000 MTPY)




**DESCRIPTION:**

This is a classic case study of conceptual process design. Given desired plant capacity, an overall process layout is to be developed. In this sample, 32,000 metric tons per year of cyclohexane is to be produced by hydrogenation of benzene. The reaction equilibria were taken from literature.

First step of the design involves solving the flowsheet 'forward', i.e., without any recycle loop. Once it is done, and behavior of unit operations has been determined, the recycle loops would be closed, and then the overall process balance found.

With the flowsheet ready, it is very easy to examine the influence of various process parameters on equipment size or utility consumption. A Sensitivity Analysis option has been demonstrated as an invaluable tool for this type of examination.

CHEMCAD 5 incorporates Costing option. The cost of typical equipment units can be calculated by Chemical Engineering methodology at level of Preliminary Estimates. The source code has been written as Calculator/Parser in simple CHEMCAD Inline-C language, and the calculational methods are accessible for the users. The users can modify all costing procedures according to their local needs, data, and they can even write completely new costing formulas. CHEMCAD, thus no need for expensive compiler, instantly executes any change applied to the costing procedures.