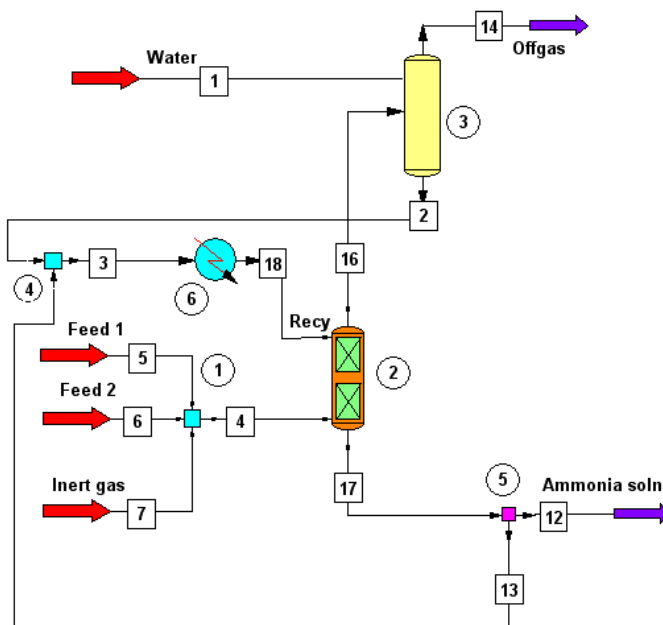# Ammonia Absorber, Carbamate System

DESCRIPTION:

Off-gas of the urea plant contains considerable amount of ammonia that must be recovered before the offgas is disposed. The commercial product of the unit is concentrated aqueous ammonia solution. As hydrogen is present in the system, nitrogen is introduced to dilute off-gas to concentrations below explosion limits. Calculation of the process was never simple, because carbon dioxide, ammonia, and water form carbamate in a reversible reaction, and the equilibria heavily depend on temperature, pressure, and concentrations.

The calculated results have been positively compared to those measured at operating production unit. The Electrolyte option was applied.

Interesting fact is that the CHEMCAD user can track the varying compositions of CO_2, NH_3, H_2O, and the carbamate throughout the process. Both Apparent Components and True Species methods can be used to calculate ionic behavior of the system.

It is important that once the Electrolyte option has been launched, the user can concentrate on solving the problem in the usual way, and CHEMCAD takes care of handling the ionic system in the background.