PROCEDE

Absorption / Desorption setup

Custom made

Purpose

Mass transfer is the basis of many (chemical) processes and underlies the various separation processes where one or more components migrate within one phase or from one phase to another and occurs in the net direction of a decreasing concentration. The mechanism of mass transfer depends upon the dynamics of the system(s) in which it occurs. Mass can be transferred by two distinct modes of transport, molecular mass transfer and convective mass transfer. Whenever a mixture contains two or more molecular components of different relative composition from point to point, an apparent natural process occurs in which tends to diminish any inequalities of composition. This macroscopic transport of mass, independent of any convection within the system, is defined as molecular mass transfer. Mass transfer between phases, immiscible, and partially miscible mixtures is often a result of the moving dynamics of and in the system. This mode of transfer is called convective mass transfer, and depends on both the transport properties and the dynamic characteristics of the migrating component(s). A distinction must be made between two types of convective mass transfer. If a pump, rotor, or a similar device causes a motion resulting in mass transfer, the process is called forced convection. If the mass transport is due to density differences, the process is called free or natural convection.

Experimental Setup

The setup consist of a stirred tank reactor which can be operated in batch, semi- continuous, or continuous mode for both phases. The interfacial area, phase volumes, temperatures, flows, etc. can be held constant, thus the mass transfer takes place in a controlled environment. Following from this the mass transfer process can be easily studied and compared to each other either it is an absorption or desorption process.

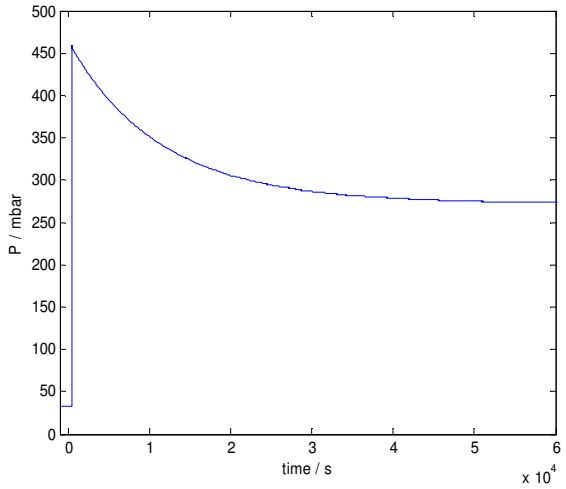
P = (0 to 2) bara

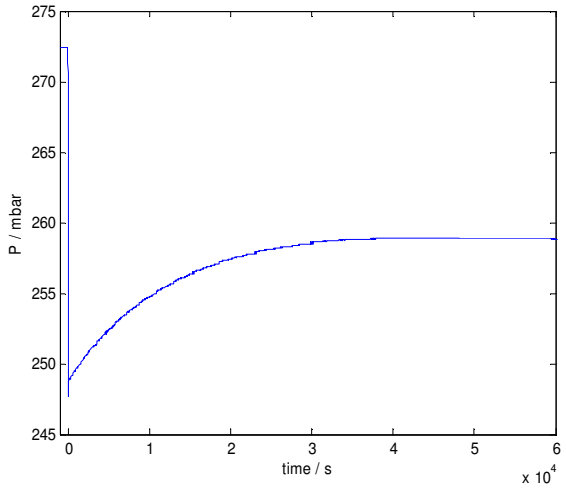
T = (5 to 50) ℃

Quantity needed: approx. 2 L of total solution and gas

Results

The figures below shows typical batch absorption and desorption measurements. The liquid side mass transfer coefficient (kL) can easily be derived from the measured results.





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