Diffusivity

Fall 2009

TO: Engineering Development Branch

FROM: Engineering Division

SUBJECT: Diffusion of CO$_2$

We have contracted with a company to develop a system that removes carbon dioxide (CO$_2$) from a nitrogen (N$_2$) stream. As part of the design, we need to know the diffusivity of CO$_2$ in N$_2$ at room temperature. Please recommend an appropriate value of the CO$_2$ diffusivity. The value may differ from literature because 1) our ambient pressure is significantly different from standard pressure and 2) the N$_2$ stream is different from normal air. It is not clear how much these two deviations will affect the diffusivity and/or how accurately published methods will predict the "correct" value.

A diffusion cell in our laboratory may be helpful in measuring the CO$_2$ diffusivity. One concern we have about the diffusion cell is that we are not sure if all of the CO$_2$ is captured for analysis. Please address this concern along with providing a value for the CO$_2$ diffusivity.

We look forward to receiving your recommended value.