

Diffusivity

Fall 2009

TO: Engineering Development Branch

FROM: Engineering Division

SUBJECT: Diffusion of CO₂

We have contracted with a company to develop a system that removes carbon dioxide (CO₂) from a nitrogen (N₂) stream. As part of the design, we need to know the diffusivity of CO₂ in N₂ at room temperature. Please recommend an appropriate value of the CO₂ diffusivity. The value may differ from literature because 1) our ambient pressure is significantly different from standard pressure and 2) the N₂ 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 CO₂ diffusivity. One concern we have about the diffusion cell is that we are not sure if all of the CO₂ is captured for analysis. Please address this concern along with providing a value for the CO₂ diffusivity.

We look forward to receiving your recommended value.