

### Increased Carbon Dioxide Absorption Rates in Carbonate Solutions by Surfactant Addition

**Researchers: Brett Spigarelli, Paul Hagadone**

#### **Abstract**

To meet the growing need for CO<sub>2</sub> capture and storage technology, Michigan Technological University is researching CO<sub>2</sub> capture and storage using carbonate solutions. The objective of the present study was to increase the absorption rate of CO<sub>2</sub> into the carbonate solution without reducing the absorption capacity of the solution. This approach used a surfactant (a polypropylene glycol methyl ether (PPGME) surfactant called DOWFROTH 200) to chemically alter the gas bubble size. Experiments were conducted to study the absorption rate of CO<sub>2</sub> at varying surfactant concentrations of 0, 0.12, 0.24, 0.36, and 0.48 g/L. Results showed that as the concentration of surfactant increased in solution, the absorption rate also increased. The CO<sub>2</sub> absorption rate increased from 3.45 mmol/min CO<sub>2</sub> at 0 g/L PPGME to 3.92 mmol/min CO<sub>2</sub> at 0.48 g/L PPGME. This amounted to a 14% increase in the CO<sub>2</sub> absorption rate with no decrease in absorption capacity of the solution.