

# Viscosity measurement of aqueous and non-aqueous amine solutions for CO<sub>2</sub> capture

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## **Introduction and background:**

Carbon dioxide (CO<sub>2</sub>) is one of the main contributors to global warming and the removal of CO<sub>2</sub> from industrial gas streams has become even more important due to the focus on the reduction of greenhouse gas emissions.

The amine-based chemical absorption process is considered the most feasible method for the removal of CO<sub>2</sub>. Monoethanolamine (MEA) has been employed as an effective industrial absorbent with its rapid reaction rate, relatively low cost, and thermal stability. However, other amines are being considered in an attempt to lower capture costs. There is a shortage of physiochemical data on such solutions, whether non-loaded or loaded with CO<sub>2</sub>. Such data are critical for accurate chemical engineering design of most units in a CO<sub>2</sub> capture plant affecting both CO<sub>2</sub> capture rate and energy management.

## **Problem description and objective:**

This work provides new experimental viscosity data of different CO<sub>2</sub>-loaded and non-loaded carbon capture solvents for which there is limited or no data available in the literature. The viscosity values are quantified by performing laboratory experiments under different temperatures, amine concentrations, and CO<sub>2</sub> loadings. Different correlations have been used to fit the measured data, and the accuracy of data fitting was evaluated. The uncertainties associated with viscosity measurements were also calculated and reported with the measured data.



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