## Thermophysical Properties of Mixed Amine Solutions at High Pressures for Carbon Dioxide Capture

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Global climate change, energy efficiency and switching from fossil fuels to biofuels are the most important issues related to environment, energy, and economy. Global climate is changing due to greenhouse gas emissions. These GHG emissions include carbon dioxide, methane, NO<sub>x</sub>, SO<sub>x</sub> etc. Carbon dioxide (CO<sub>2</sub>) is one of the most important greenhouse gases (GHG) and is responsible for about 70 % of the enhanced greenhouse effect and global warming. Many solutions are focused on removing carbon dioxide from exhaust gases. Post-combustion CO<sub>2</sub> capture technology is the most mature solution which is based on absorption through chemical absorbents. Absorption with amine-based solvents has been extensively studied and regarded as the most effective technology for CO<sub>2</sub>. Accurate knowledge of physical properties of solvents, in wide ranges of pressures and temperatures, is essential for rational design and optimization of CO<sub>2</sub> capture units. In the present work, thermophysical properties such as density and dynamic viscosity were accurately measured for aqueous solutions of the mixture methyldiethanolamine (20 % w) and piperazine (10 % w) in wide temperature and pressure ranges. Densities were measured using an Anton Paar DMA HPM densimeter with a standard uncertainty of ± 0.7 kg·m<sup>-3</sup>, and viscosities by means of a falling body viscometer (stainless steel falling cylinder) with a relative standard uncertainty better than 2.9 %. Both properties were measured from 293.15 K to 393.15 K and up to 100 MPa. In addition, experimental data were correlated with different models, and the results are presented and discussed.

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