

UREA-ETHANOL-WATER SOLUTION PROPERTIES FOR DIESEL NO_x CONTROL USING UREA SCR

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Selective Catalytic Reduction (SCR) of NO_x using urea has been demonstrated in stationary diesel engine applications. One major issue is the ability to operate the urea system at ambient conditions of at or below 0° C. Adding ethanol to the urea solution has been proposed to reduce freezing temperature of the solution. In order to inject an accurate amount of urea to the SCR reactor and minimize the ammonia slippage, the urea-water-ethanol solution properties, e.g., density, must to be accurately measured and correlated within the

range of the SCR operating conditions. Experimental results of the volume and density measurements of the urea-water, ethanol-water, and urea-ethanol-water systems will be presented. This work will continue to measure the solubility of the urea in water and in the ethanol-water solution under various temperatures. The freezing points of the urea-water and the urea-ethanol-water solutions will be tested under different urea and ethanol concentrations. Observations from the tests will be updated.