

## **Numerical Simulation of Urea Water Solution Evaporation Behavior inside the Diesel Selective Catalytic Reduction System**

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**Abstract :** Selective catalytic reduction (SCR) converts the nitrogen oxides with the aid of a catalyst by adding aqueous urea into the exhaust stream. In this work, the urea water droplets are sprayed over the exhaust gases by treating with Lagrangian particle tracking. The evaporation of ammonia from a single droplet of urea water solution is investigated computationally by convection-diffusion controlled model. The conversion to ammonia due to thermolysis of urea water droplets is measured downstream at different sections using finite rate/eddy dissipation model. In this paper, the mixer installed at the upstream enhances the distribution of ammonia over the entire domain which is calculated for different time steps. Calculations are made within the respective duration such that the complete decomposition of urea is possible at a much shorter residence time.

**Keywords :** convection-diffusion controlled model, lagrangian particle tracking, selective catalytic reduction, thermolysis

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