

## ***Experiments and modeling of SNCR process in a cyclone reactor***

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In this study, the SNCR process was investigated in a pilot scale cyclone reactor by experiments and modeling. Experiments were conducted under different conditions, with inlet gas temperatures of 850-1100 °C, inlet gas velocities of 12-15 m/s, NH<sub>3</sub>/NO feed molar ratios of 0-7, and with and without particle loading. NO<sub>x</sub> reduction, ammonia slip, temperature, and concentration profiles inside the cyclone were measured. With a NO inlet concentration of 500 ppm, 90% NO reduction was achieved at inlet temperatures of 900-1000 °C and a NH<sub>3</sub>/NO ratio of approximately 3, but with ammonia slips of 150-300 ppm. Measurements showed that the NO reduction took place mainly in the cyclone inlet, while ammonia converted further inside the cyclone, even in zones with temperatures significantly lower than the typical SNCR window. The system was modeled by reactor network models using detailed kinetics, and a model that could describe the internal concentration profiles was developed.