



CHALMERS
Competence Centre for Catalysis

Master thesis, 30 or 60 credit points: Collaboration KCK, Chalmers and Cummins Inc., USA

Experimental investigations of ammonia selective catalytic reduction for cleaning emissions from vehicles

This is a master thesis work at Chemical Engineering and Competence Center for Catalysis at Chalmers in collaboration with Cummins Inc., USA.

The objective is performing experiments on catalysts used on vehicles, in order to increase the knowledge about the interactions of gases with the material. Trucks equipped with diesel engines have a better fuel economy compared to engines that run at stoichiometric conditions. There is, however, a major problem with oxygen excess in the exhaust and that is the catalytic reduction of the nitrogen oxides. One solution is urea selective catalytic reduction of NO_x over ion-exchanged zeolites or over vanadium/titanium oxide. The urea decomposes to ammonia and HNCO. HNCO is further hydrolysed to form NH₃ and CO₂. The ammonia then reacts selectively with NO_x on the catalyst to produce N₂ and H₂O. This system has many important reactions that need to be investigated further.

The objective of the work is to examine ammonia SCR over Cu zeolites. Catalyst synthesis, XRD, flow reactor experiments and micro calorimetry will be used. This master thesis is a collaboration with Cummins Inc, a diesel engine manufacturer.

Education program: Chemical Engineering (K), Chemical Engineering with Physics (Kf), or Physics (F).

Project start: Flexible.

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