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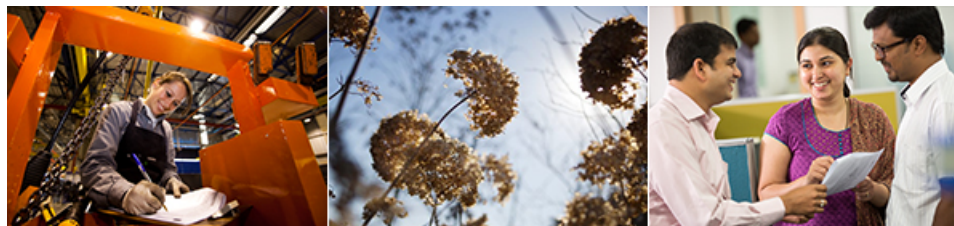
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Auto req ID 56071BR
Position Master Thesis - deactivation studies of NH₃-SCR catalyst
Country Sweden
State/Province Västra Götaland
City/Town Göteborg
Functional Area Research and Development
Entity Group Trucks Technology
Employment/Assignment Type Thesis

About us

The Volvo Group is one of the world's leading manufacturers of trucks, buses, construction equipment and marine and industrial engines under the leading brands Volvo, Renault Trucks, Mack, UD Trucks, Eicher, SDLG, Terex Trucks, Prevost, Nova Bus, UD Bus, Sunwin Bus and Volvo Penta.

Volvo Group Trucks Technology provides Volvo Group Trucks and Business Area's with state-of-the-art research, cutting-edge engineering, product planning and purchasing services, as well as aftermarket product support.

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Position Description

Economic and environmental concerns have increased the demands for improved fuel efficiency. To improve fuel efficiency (decrease the fuel consumption), combustion engines need to operate under lean conditions, meaning with excess of oxygen during the combustion process, which gives a more complete combustion and higher fuel efficiency when compared to stoichiometric combustion.

Improved fuel combustion under lean conditions, leads to increased formation of nitrogen oxides (NO_x). High NO_x emissions are negative for both our health and the environment. A well-established and effective method to eliminate nitrogen oxides under oxygen excess is selective catalytic reduction of NO_x using ammonia as reducing agent (NH₃-SCR). However, several challenges arise when using these materials in exhaust aftertreatment systems. One of the more important issues is the hydrothermal stability of the ion-exchanged zeolites used as NH₃-SCR catalysts.

Suitable background

The project will be performed at the Competence Centre of Catalysis (KCK) at Chalmers in collaboration with AB Volvo. The project is suitable for one student with the ability to work independently and creatively. Suitable Background is a Master's program in Chemistry, Chemical Engineering or Chemical Engineering with Physics. A strong interest of contributing to improved environment and human health is of course necessary.

Description of thesis work

The objective of this master thesis is to study the deactivation mechanism of metal-exchanged zeolites for NH₃-SCR applications. The activity and selectivity of the materials will be studied before and after hydrothermal deactivation in a synthetic-gas bench (SGB) reactor. The materials will be further studied using several characterization techniques. The student is expected to make a literature study. Design, perform and evaluate the experimental results, and finally have an oral and written presentation of the project (master thesis) at both AB Volvo and Chalmers.

Thesis Level: Master

Language: English

Starting date: Spring 2016

Tutor

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Last application date 05-Feb-2016

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