NOx reduction on ag electrochemical cells with a K-Pt-Al 2O3 adsorption layer - DTU Orbit
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Ag electrochemical cells with and without a K-Pt-Al 2O3 adsorption layer were tested for NOx reduction under oxygen-rich conditions. The effect of the addition of the adsorption layer on the electrochemical reduction of NOx was investigated by a conversion measurement, an impedance analysis and a microstructure characterization. The blank Ag cell was incapable of converting NOx to N2 under any of the investigated conditions. In contrast, the Ag cell with an adsorption layer showed good NOx reduction activity. An 82% NOx conversion with 100% N2 selectivity and 7.7% current efficiency was achieved at -1.25 V and 500°C. An impedance analysis revealed that the adsorption layer promoted the adsorption and the surface diffusion of the NOx species at or near the triple phase boundaries (TPBs) and the formation of NO2. A severe degradation was also observed on the cell with the adsorption layer, which was caused by the corrosion of the Ag cathode and the subsequent migration of the Ag into the adsorption layer during the operation. © 2013 The Electrochemical Society.

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