

# **Low temperature plasma assisted catalytic reduction of NO<sub>x</sub> in simulated marine diesel exhaust**

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## **Abstract**

Plasma Assisted Catalytic Reduction (PACR) of NO<sub>x</sub> has been investigated at laboratory scale for gas stream compositions representative of marine diesel exhausts. PACR NO<sub>x</sub> reduction in excess of 90% was measured at 350°C, a plasma specific energy of 60 J/l and two NO<sub>x</sub> concentrations (1200 & 1800ppm). PACR NO<sub>x</sub> reduction of over 50% was measured for simulated marine engine conditions at 250 °C, 60J/l and 1200 ppm NO<sub>x</sub>. The performance under these conditions could be increased, achieving a peak of ~74% NO<sub>x</sub> reduction, although at a relatively high plasma power. Water, present in diesel exhaust, was shown to inhibit the poisoning effects of fuel sulphur using SO<sub>2</sub> as a representative exhaust component. The PACR system performance demonstrated tolerance to simulated fuel sulphur levels of up to 1% for the duration of the tests. PACR performance was also shown to be sensitive to the amount of hydrocarbon reductant used.