

Erratum

Lundberg, B., Sjoblom, J., Johansson, Å., Westerberg, B. et al., "Parameter Estimation of a DOC from Engine Rig Experiments with a Discretized Catalyst Washcoat Model," *SAE Int. J. Engines* 7(2): 1093-1112; 2014, doi:10.4271/2014-01-9049

On page 1103, the published paper omitted important text before and after figure 6. The text should read as follows:

The analysis of the Weizs modulus is strictly based on simulation data and to get a confirmation of mass transfer limitations in the measurement data additional analysis is necessary. In figure 6 the temperature dependence of the conversion of NO is shown for three different transients and two catalyst configurations. The NO conversion is calculated relative to the thermodynamic limitation, which means that a 100% conversion corresponds to an outlet NO concentration equal to the thermodynamic limitation, see equation 9.

$$NO_{conv} = \frac{y_{NO,in} - y_{NO,out}}{y_{NO,in} - y_{NO,th}} \quad (9)$$

Where NO_{conv} is the NO conversion and $y_{NO,th}$ is the thermodynamic limit for NO mole fraction calculated at outlet conditions. It should be noted that the transients in figure 6 are taken from data spanning several minutes and the influence from physisorbed NO from time points outside of the depicted data therefore should be negligible. The difference in exhaust composition and flow will however be of importance for the NO conversion which is also the main reason why the conversions differ between the three transients.

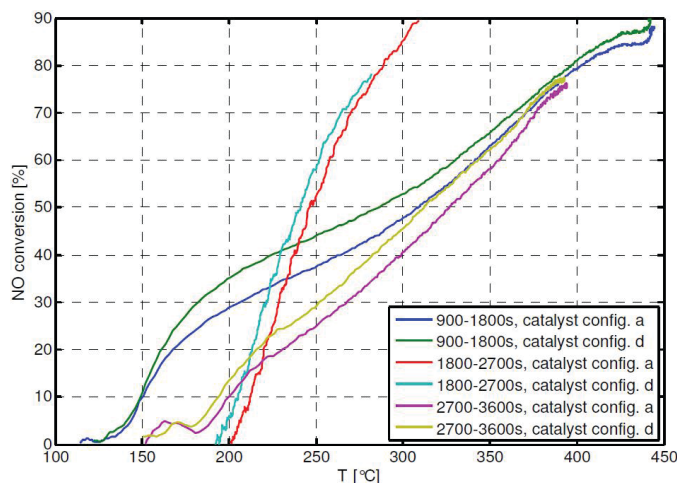


Figure 6. Comparison of NO conversion between catalyst configuration a and d at three different transients in temperature occurring between 900 s and 2700 s of the simulation shown in figure 9.

The catalyst configurations compared in figure 6 have the same amount of noble metal (15 g/ft³monolith) but different washcoat thicknesses (0.110 mm for configuration a and 0.055 mm for configuration d). The thinner washcoat of catalyst configuration d results in lower internal transport resistance than for catalyst configuration a which will give a higher conversion for catalyst configuration d if internal mass transport is present. When the three different temperature transients in figure 6 are compared it is apparent that the conversion is indeed higher for catalyst

configuration d at certain temperatures. At lower temperatures the conversion will be limited by kinetic reaction rate which means that only the platinum loading will be of influence and not the transport resistances. As the temperature increases the influence of internal transport resistance also increases which can be seen as a difference in conversion between the two catalyst configurations for all three transients at temperatures above 200 °C. This difference is most pronounced for the transients taken between 900 s and 1800 s but is also clear for the two other transients. At even higher temperatures the external mass transport resistance gets more dominant which will result in a more equal conversion for the catalyst configurations at higher temperature. The fact that the conversions are equal at low temperatures is a good indication that the difference in conversion when the temperature is increased is not attributed to a difference in dispersion but rather to internal transport resistance.

Even though measurement data indicate that there will be mass transfer limitations for catalyst configuration a for the NO oxidation reaction the Weisz-moduli presented in figure 4 are low. For example the Weisz-modulus for Mode 3 is below 0.3 at 250°C for all the transients shown in figure 6 which could indicate that the estimated effective diffusivity for NO is too high.