# Supporting information for paper

# A laboratory scale fast feedback characterization loop for optimizing coated catalysts for emission control

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**XRD analysis of $Pd/Al_2O_3$ catalyst after different applied milling intensities**

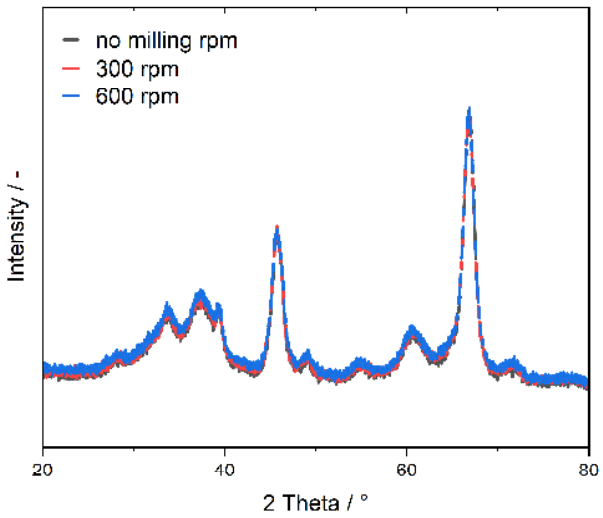


**Fig. S1** XRD patterns after different milling intensities showing no apparent change in crystal structure

**Mechanical stability tests as a function binder content**

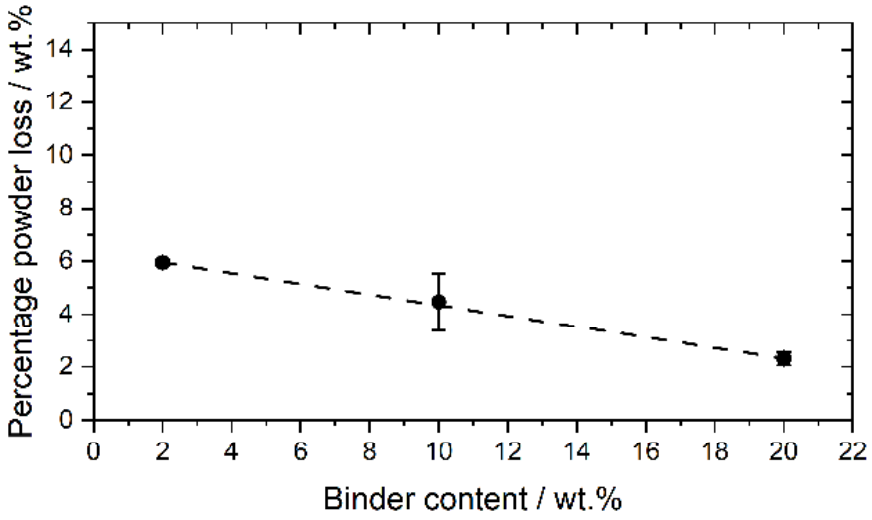


**Fig. S2** Loss of powder during tests for mechanical stability as a function of added binder

**Rheological Measurements**

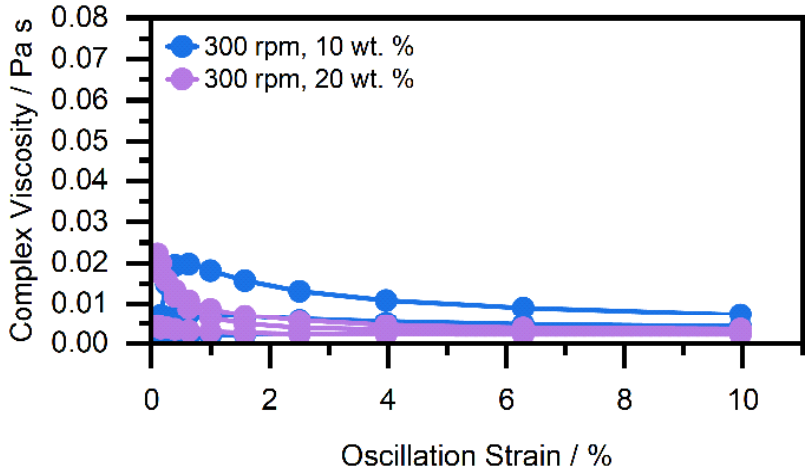


**Fig. S3** Rheological measurements of a slurry containing 10 and 20 wt. % binder exhibiting a similar behavior.

**Data and Image processing for µ-CT**

The reconstructed image data from micro-CT was treated with ImageJ and Avizo 3D software (Thermofischer Scientifc, USA). The raw volume data was first rotated and cropped in ImageJ to remove the outer volume of sample measured which might have been affected while extracting subvolumes from the washcoated sample. With Avizo, the volume obtained was filtered with median filter applied in 3D (neighborhood: 26, iterations: 3, type: iterative) for noise reduction. To calculate the thickness of washcoat and OCA; following procedure was followed:

Parameters used for modules:

Closing in 3D:- Type: Ball, Size: 5px, Precision: Faster

Fill holes in 3D:- Neighborhood: 26

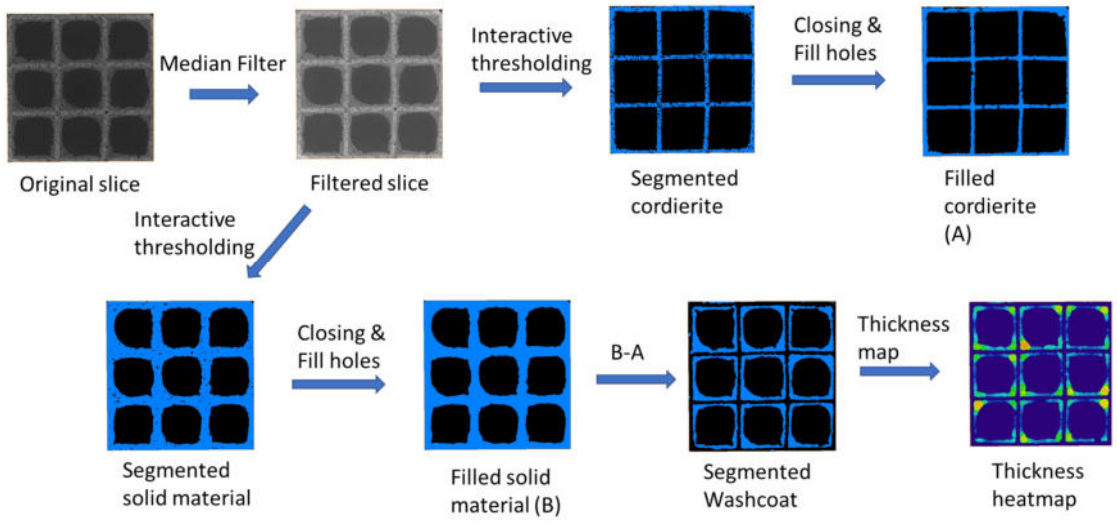


**Fig. S4** Workflow of data and image processing of the tomography data

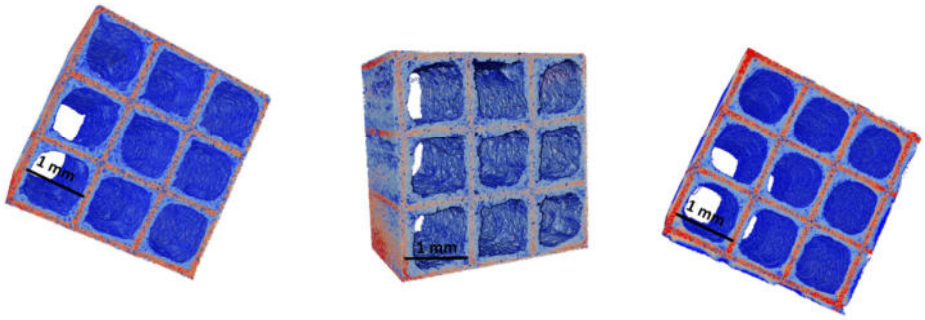


**Fig. S5** 3D images of different samples a) 2 wt. %; 300 rpm b) 10 wt. %; 300 rpm c) 20 wt. % 300 rpm

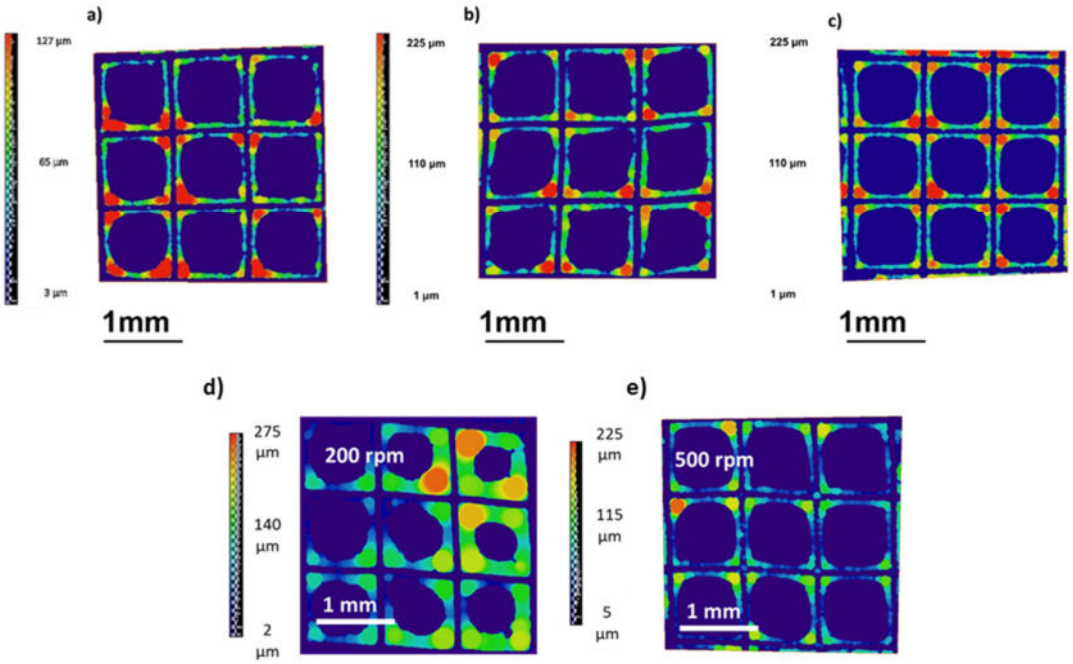


**Fig. S6** Heat maps of the resulting layer thicknesses a) 2wt. % 300 rpm b) 10 wt. % 300 rpm c) 20 wt. % 300 rpm d) 10 wt. % 200 rpm e) 10 wt.% 500 rpm

**Photos of different samples as basis for the photo-based channel analysis**

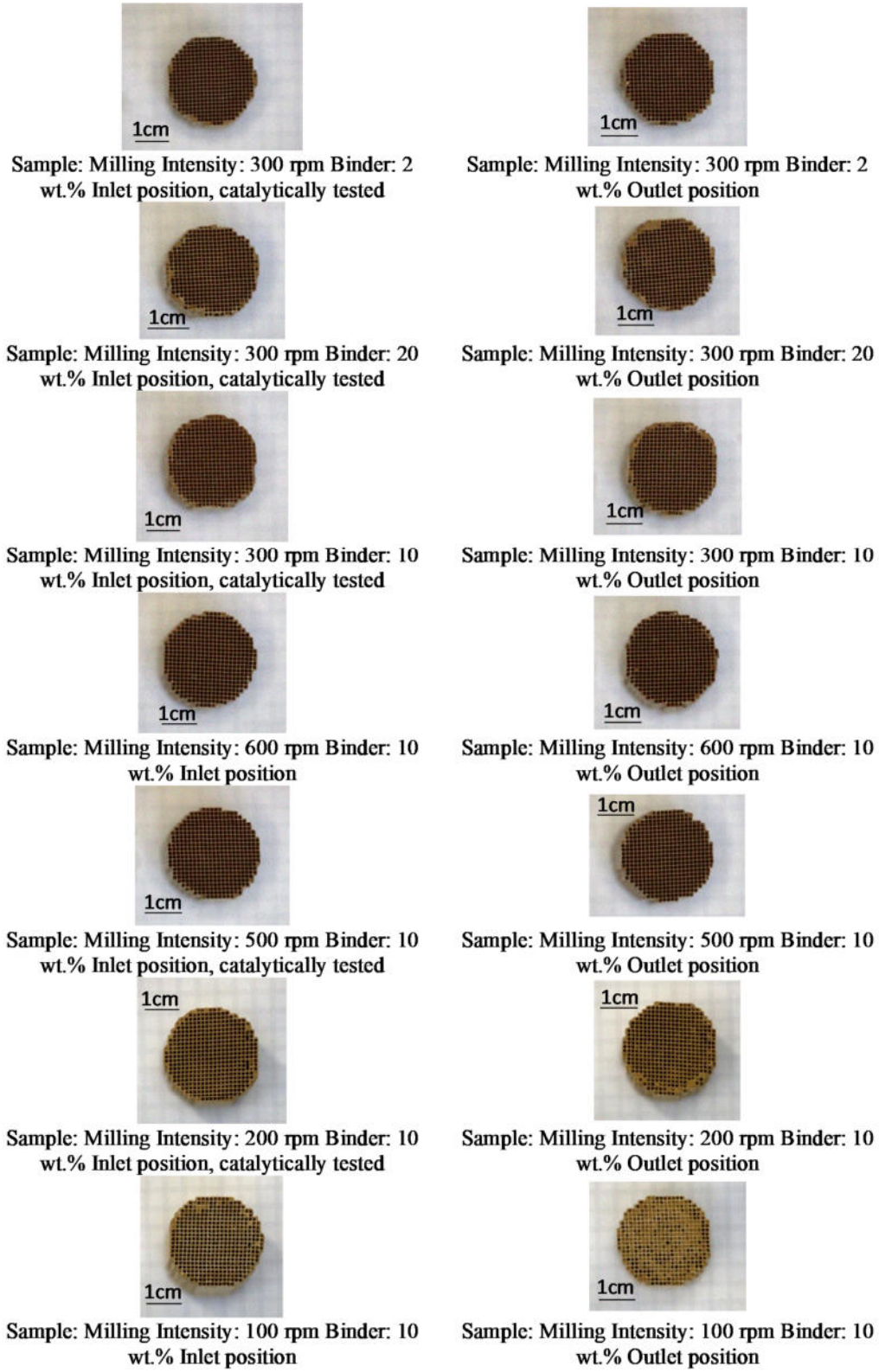


**Fig. S7** The evaluated pictures of the coated honeycombs and the associated parameters

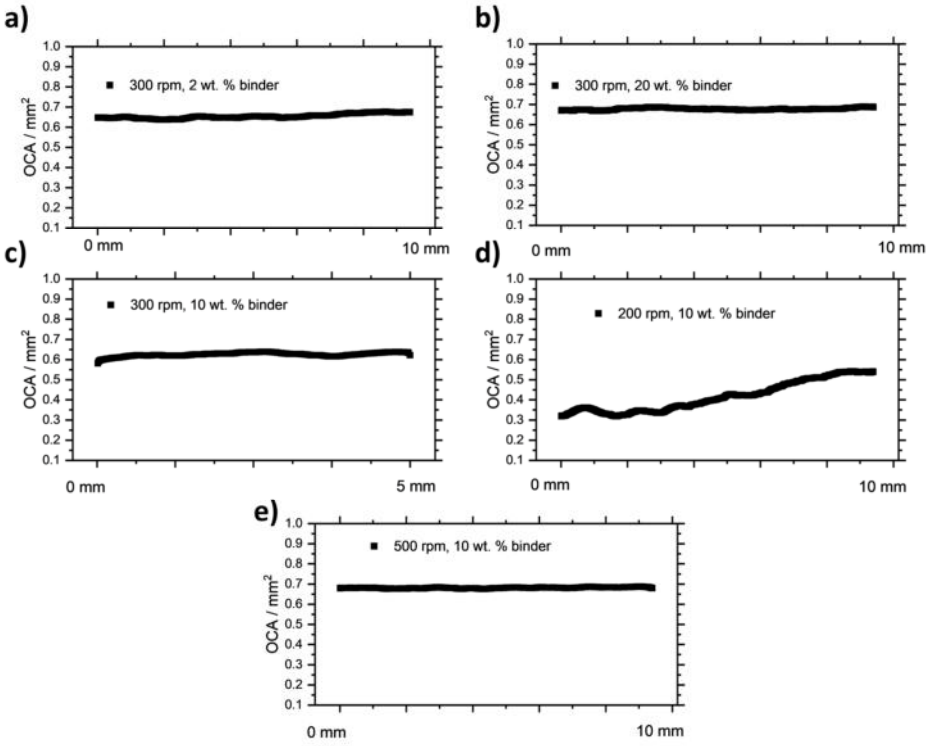


**Fig. S8** Open channel area as a function honeycomb length for a) 300 rpm and 2 wt. % binder, b) 300 rpm and 20 wt. % binder, c) 300 rpm and 10 wt. %, d) 200 rpm and 10 wt. % binder and e) 500 rpm and 10 wt. binder.