Heating Ceria to 50 °C and 150 °C in a CO Atmosphere After Cleaning in O2

Date: 2023-04-12
Tags: CO DRFITS CeO2 powder High temperature
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Goal :

To collect Ceria data at elevated temperatures of 50 °C and 150 °C to gauge the extent of reduction when compared to room temperature.

Procedure :

Run background in O_2 before heating - LC0062.0

Remove CO by flushing with O_2 for 10 minutes

Run second background in O_2 at rt - LC0062.1

Heat for 2 hours in O_2 at 550 °C (Start 09:45)

Cool down to rt before heating to 150 °C for a second background in O_2 - LC0062.2
mirrors needed adjusted
LC0062.3

Heat to 150 °C then turn on CO

LC0062.0000-0686

Switch Sample

Run background in O_2 before heating - LC0063.0

Run another background to remove CO signal

LC0063.1
LC0063.2
LC0063.3 Start heating (14:15)

LC0063.0000-0200 - CO ads at 50 °C change over time, initial adsorption good, first few spectra, then water appears and displaces CO

3650 increase 2175 decrease subtract 199-100

let it run over night to see behavior with water

Results :

Water is again an issue, the bands that are expected appear, however, they are leaving the surface overtime and thus it is hard to determine and needs a further experiment.

(Data saved - DRIFTS PC; Folder – Data --> L Caulfield; File name - 20230412_CeO2_50_150)

Unique eLabID: 20230706-f905f4ef0cfb5dcb293ed6e78950f83d7e724d2d
Link: https://ifgselabftw.ifg.kit.edu/experiments.php?mode=view&id=2301