Treating Ceria Powder at High Temperatures in an Oxygen Atmopshere

Date: 2022-12-21
Tags: DRIFTS | CO | CeO2 powder | High temperature
Created by: Lachlan Caulfield

Goal :

To Investigate the cleaning effect of O_2 at elevated temperatures.

Procedure :

Background run in oxygen before heating (2 cm-1) - LC0028.0
Heat sample to 1000 °C for 1 hour
Take second background after cooling
Increase temperature to 550 °C and flow CO 200 ml/min
Use background (2 cm-1) - LC0028.1

Heating 1 hour in O2 (start 09:45)
Cool down in O2 (start 11:45)

Flow in CO at 75 °C, after O_2 treatment - LC0028.0000-0139

heat to 100 °C at LC0028.0140
heat up carbonyl trap to 400 °C using the heat gun
increase water flow into the cell

LC0028.0141-0173 (14:38) gun switch off

Results :

It was found that the carbonyl trap stores water over time, therefor it must be replaced after each experiment, otherwise the water content will be too high for CO adsorption on metal oxides.

(Data saved - DRIFTS PC; Folder – Data --> L Caulfield; File name - 20221221_CeO2_O2_treatment_xTemp)

Unique eLabID: 20230704-676b28977ab141c51109a66efabca087be74d735
Link: https://ifgselabftw.ifg.kit.edu/experiments.php?mode=view&id=2265