CO Reduction of Ceria at 100 °C Heating for 2 Hours

Date: 2022-12-06
Tags: CeO2 DRIFTS CO
Created by: Lachlan Caulfield

Goal :

To understand and improve the cleaning process of ceria powders for improved CO adsorption

Procedure :

Measure background in oxygen 2 cm^{-1} LC0016.0
Background 0"1 measured in O_2 before heating 21 °C
Heat sample 1 hour in O_2 200 ml/min (Started 10:30)

---

cool down from 800 °C (end 30 °C) - LC0016.0000-0014

new BG after heating in O_2 (27 °C) - LC0016.1

Flow in CO 100 °C (64 scans) - ref to 16 is ok - LC0016.0015-0114

Flow in CO 100 °C (128 scans vs 61 nice bg fit, less 2176 missing the start? - LC0016.0115-0203

Stop heating (215 = 37 °C) - LC0016.0204-0292

heating to 200 °C

Heat at 200 °C, with CO - LC0016.0293-0380

Cooling down in CO Tend = 38 °C - LC0016.0381-0395

switch to Ar

Flow in Ar until no CO, whats with 2110? Tend = 29 °C - LC0016.0396-0403

switch to O_2 disappearance of 2110? LC0016.0404-0421

Results :

Two major bands can be seen below the gas phase, as well as a third that may be related to an electronic transition, however it is difficult to determine and further experiments are need to be conclusive of this

"electronic transition"

(Data saved - DRIFTS PC; Folder – Data --> L Caulfield; File name - 20221206_CeO2_COreduction_100deg_2hour)

Unique eLabID: 20230703-05657eea2f7867d6032b04b53900394a086049d2
Link: https://ifgselabftw.ifg.kit.edu/experiments.php?mode=view&id=2261