

# Heating Ceria in a CO Atmosphere for an Extended Period of Time

**Date:** 2023-02-27

**Tags:** DRFITS CeO<sub>2</sub> powder High temperature

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## Goal :

Heat Ceria after cleaning in O<sub>2</sub> over an extended period of time in a CO atmosphere to see band evolution over time at these temperatures.

## Procedure :

Run background in O<sub>2</sub> atmosphere before heating KBr LC0046.0 (Saved wrong folder --> 20230224)

KBr is dried using O<sub>2</sub> atmosphere for 1 hour at 225 °C, process is in flow (200 ml/min)

Cooling down to rt then run second background LC0047.0

Switch to CO and run experiment in batch

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Measurement at rt 1 bar of CO:

LC0047.0000-0099

Heat up to 125 °C

Measurement at 125 °C 1 bar of CO:

LC0047.0100-0199

Cool down to rt

Measurement at rt 1 bar of CO:

LC0047.0200-0299

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Switch sample to ceria and run a background in O<sub>2</sub> flow at rt LC0047.1

Heat sample to 750 °C for 1 hour

Cool down sample to rt and measure background LC0047.2

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Measurement at rt 1 bar of CO:

LC0047.0300-0399

Heat sample to 125 °C

Measurement at 125 °C 1 bar of CO: (Temp reached at LC0047.0404)

LC0047.0400-0899

Cool sample to rt (80 °C)

LC0047.0900-1399

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Flush with Ar rt

LC0047.1400-1499

## Results :

Issue with water, two bands observed but with water and OH build-up the CO is lost and therefor only negative bands are observed.

**(Data saved - DRIFTS PC; Folder - Data --> L Caulfield; File name - 20230227\_KBr\_CeO2\_Long\_Heating\_125)**



Unique eLabID: 20230704-d57e92d9c2821ae76a25f2312808e9aa73b73862  
Link: <https://ifgselabftw.ifg.kit.edu/experiments.php?mode=view&id=2280>