

# **Surface Structure Controls Self-Metalation: In-Situ IR studies of Anchored Porphyrins on Atomically-Defined Cobalt Oxide Surfaces**

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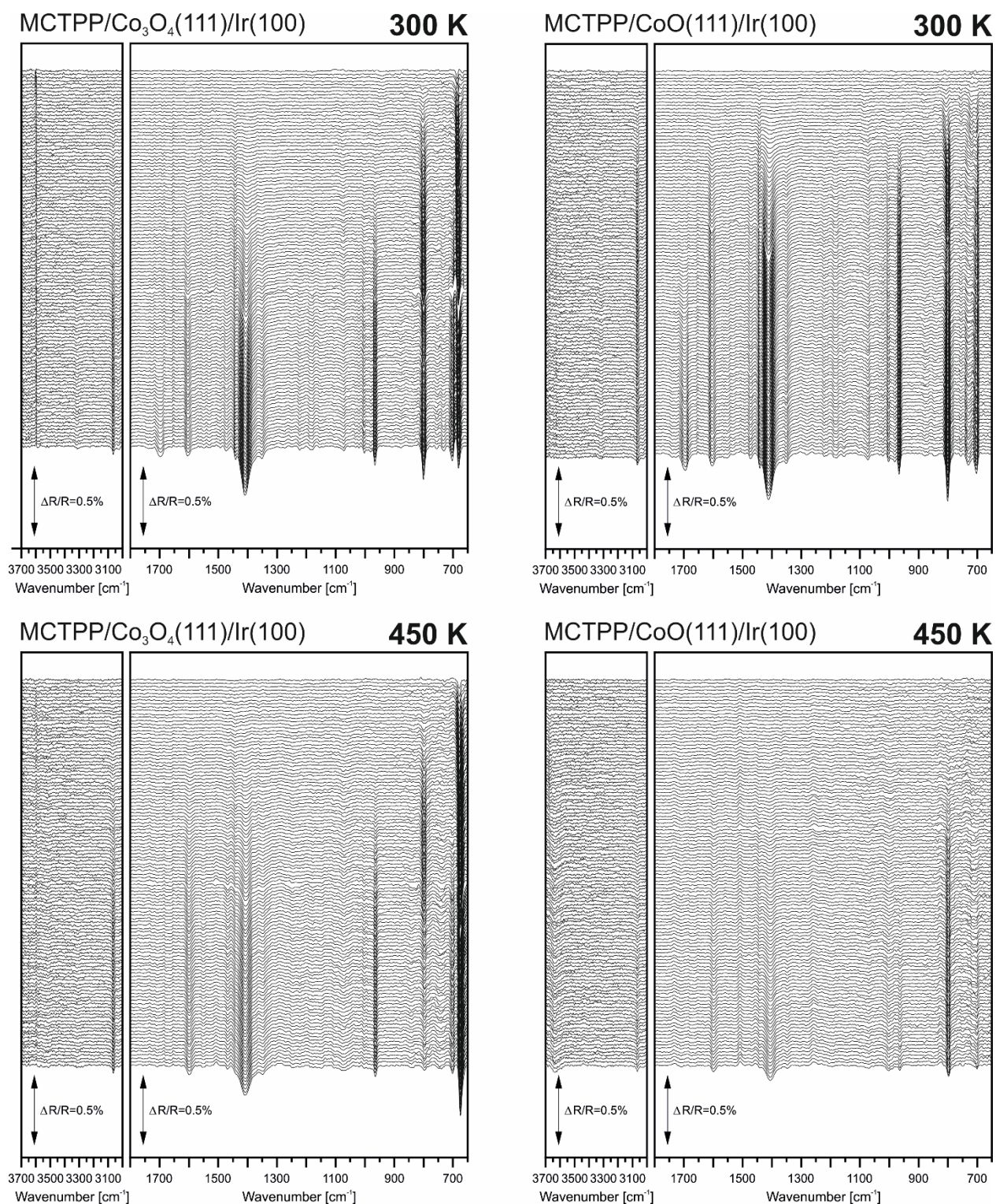
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## **Supporting Information**

### ***Contents***

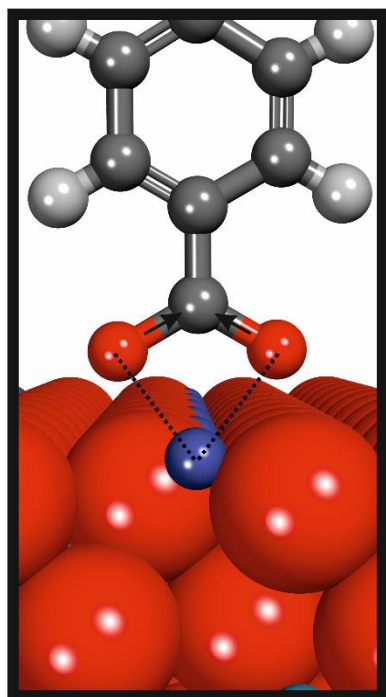
Time-resolved spectra of the measurements at 300 K and 450 K shown in the manuscript. Comparison of adsorption geometries of surface anchored carboxylates formed on Co<sub>3</sub>O<sub>4</sub>(111) and CoO(111). Heat maps of temperature-programmed measurements between 150 K and 650 K on Co<sub>3</sub>O<sub>4</sub>(111) and CoO(111).

### *Time-resolved IR spectra*

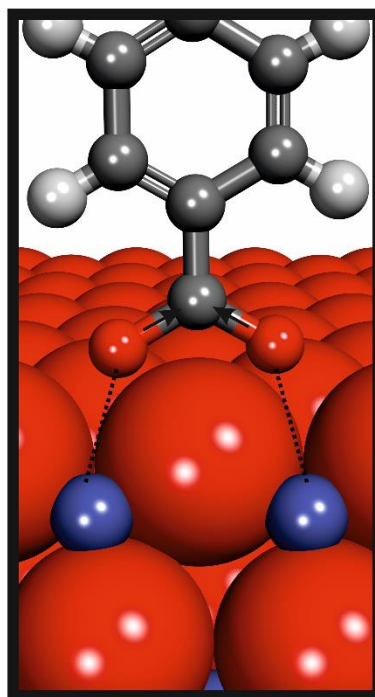


**Figure S1.** Time-resolved IRAS spectra of MCTPP adsorbed on  $\text{Co}_3\text{O}_4(111)$  (left panel) and  $\text{CoO}(111)$  (right panel) at 300 K and 450 K (note that on  $\text{CoO}(111)$  at 450 K no fully saturated monolayer coverage was achieved).

$\nu_s(\text{O}-\text{C}-\text{O})$  of  
surface carboxylate



chelating bidentate  
e.g. on  $\text{Co}_3\text{O}_4(111)$

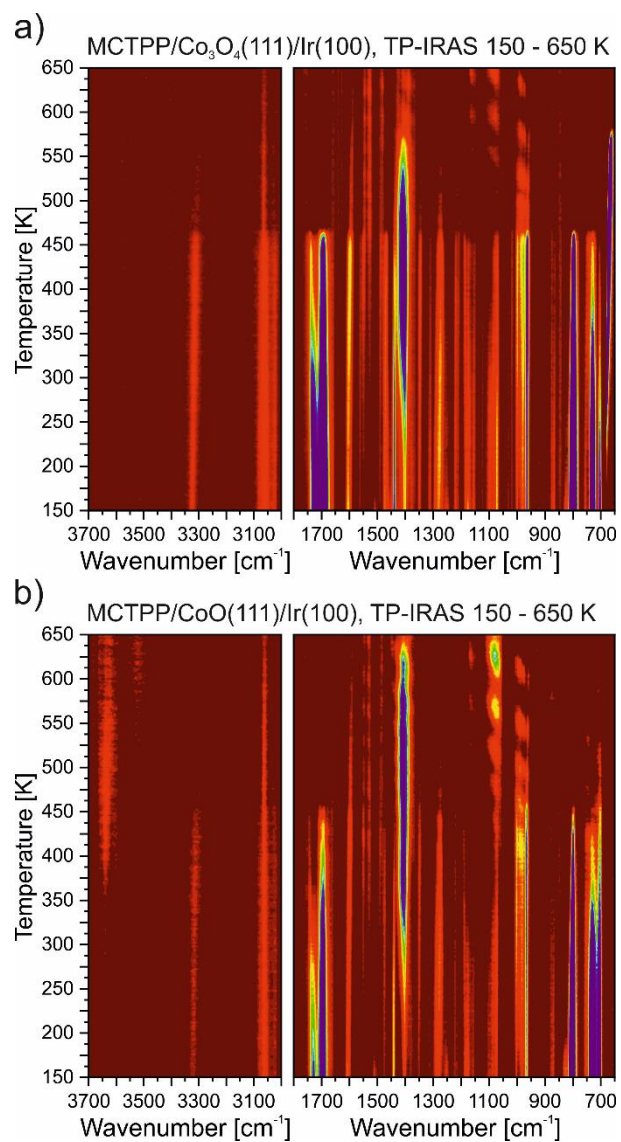


bridging  
e.g. on  $\text{CoO}(111)$

**Figure S2.** Adsorption geometries of surface anchored bridging and chelating bidentate carboxylates on  $\text{Co}_3\text{O}_4(111)$  and  $\text{CoO}(111)$ , respectively.



*Additional temperature-programmed IR data*



**Figure S3.** Heat maps of temperature-programmed measurements from 150 K to 650 K on a) Co<sub>3</sub>O<sub>4</sub>(111) and b) CoO(111), respectively.