

## Supplementary Information

### Light Alkane Interactions on Transition Metal Oxides like Zirconia using a combined Frequency Response and DRIFTS study

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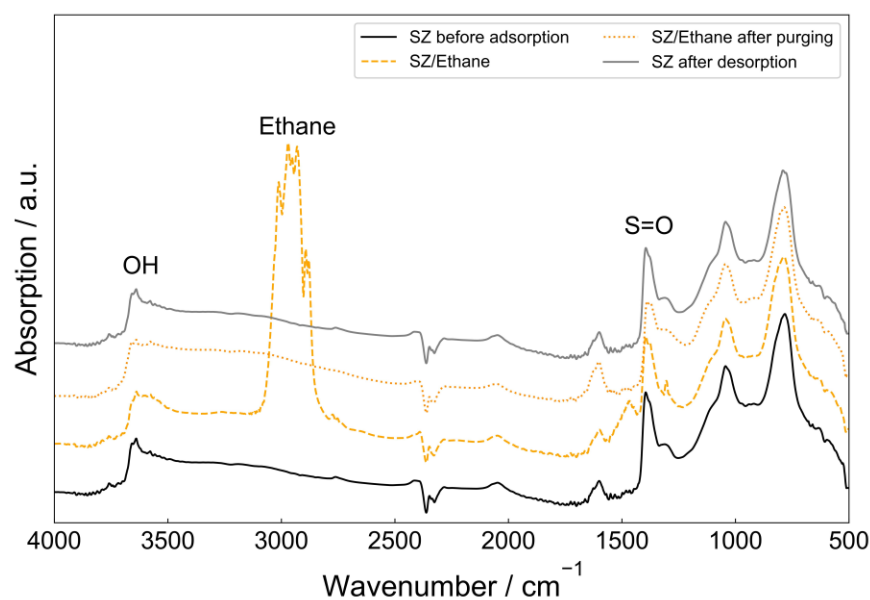


Figure 1: DRIFT spectra of SZ before adsorption, with adsorbed ethane, with adsorbed ethane after purging and after desorption at 35 °C.

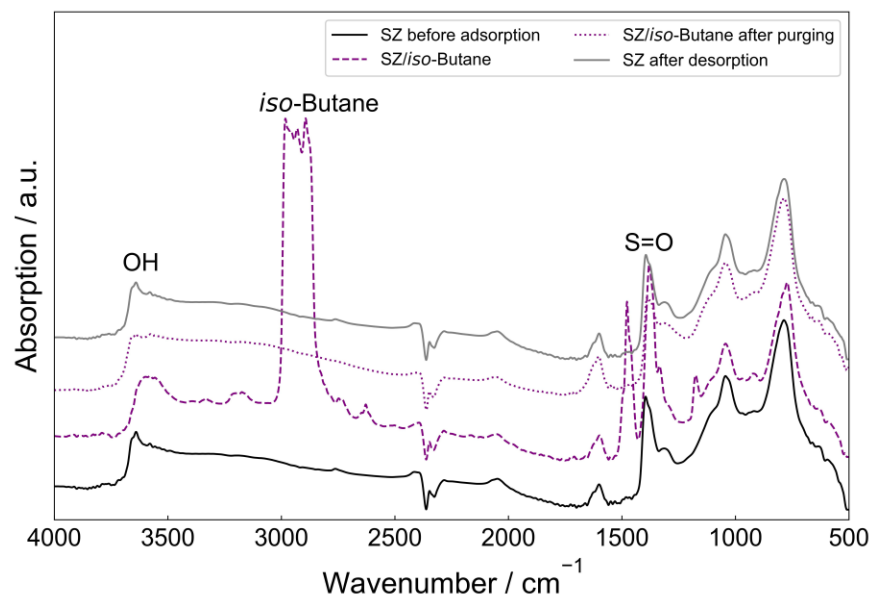


Figure 2: DRIFT spectra of SZ before adsorption, with adsorbed *iso*-butane, with adsorbed *iso*-butane after purging and after desorption at 35 °C.

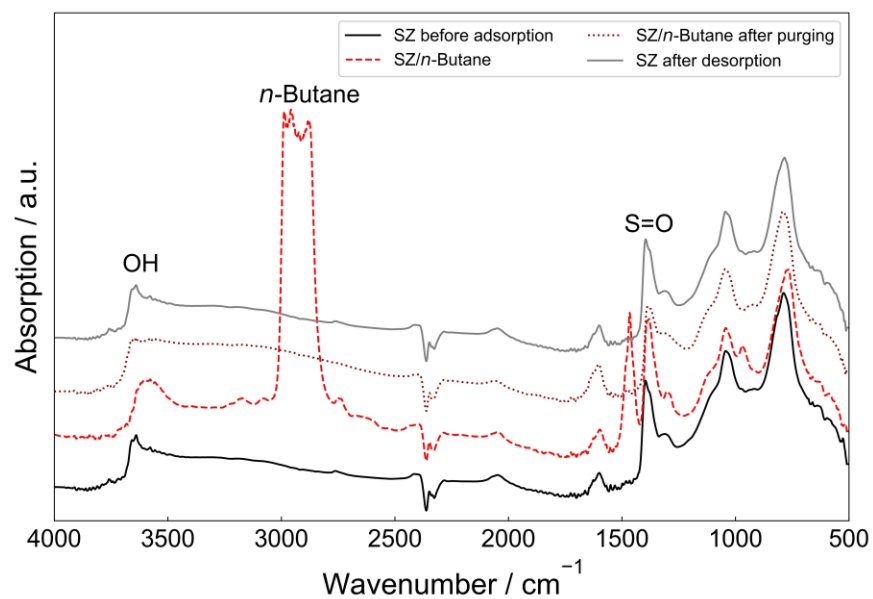


Figure 3: DRIFT spectra of SZ before adsorption, with adsorbed *n*-butane, with adsorbed *n*-butane after purging and after desorption at 35 °C.

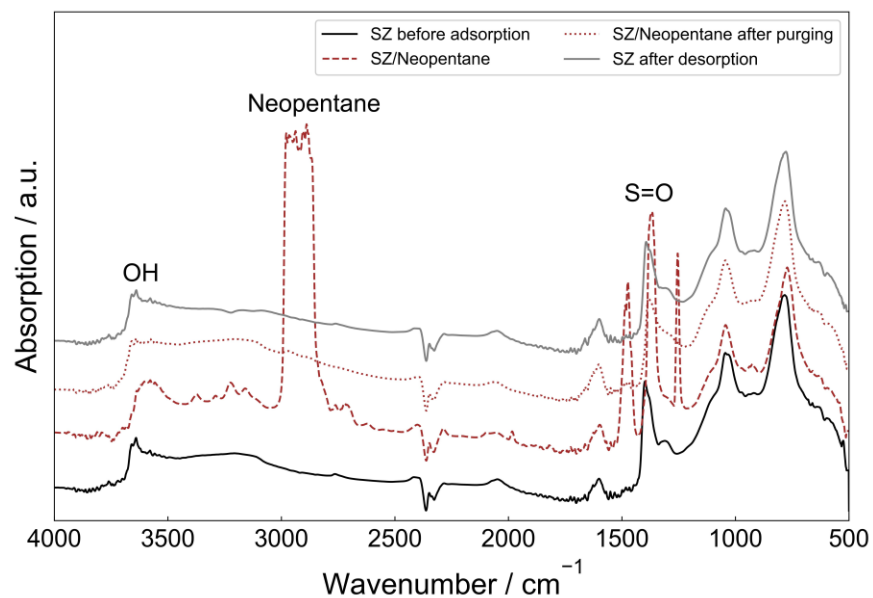


Figure 4: DRIFT spectra of SZ before adsorption, with adsorbed neopentane, with adsorbed neopentane after purging and after desorption at 35 °C.

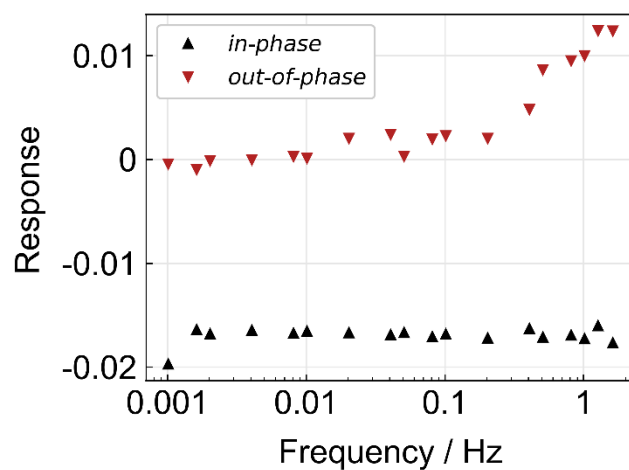


Figure 5: FR spectrum of SZ/argon ( $\vartheta = 35\text{ }^{\circ}\text{C}$ ,  $p = 2,3\text{ kPa}$ ,  $m = 1891\text{ mg}$ )

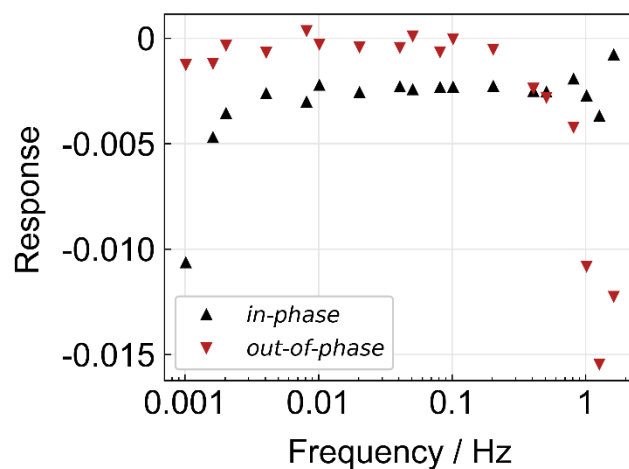


Figure 6: FR spectrum of MCM-41/nitrogen ( $\vartheta = 36\text{ }^{\circ}\text{C}$ ,  $p = 2,4\text{ kPa}$ ,  $m = 315\text{ mg}$ )

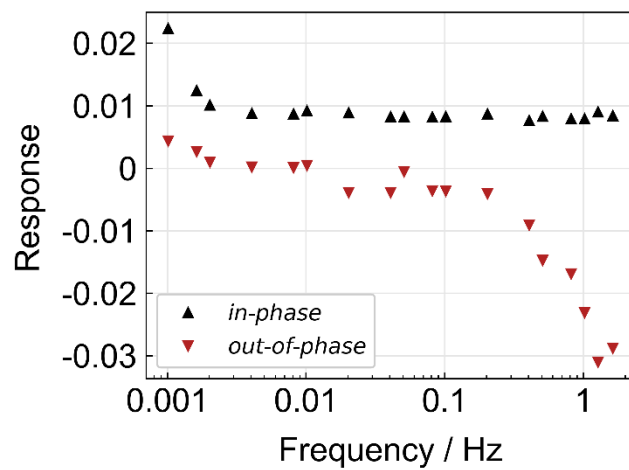


Figure 7: FR spectrum of MCM-41/methane ( $\vartheta = 36\text{ }^{\circ}\text{C}$ ,  $p = 2,4\text{ kPa}$ ,  $m = 315\text{ mg}$ )

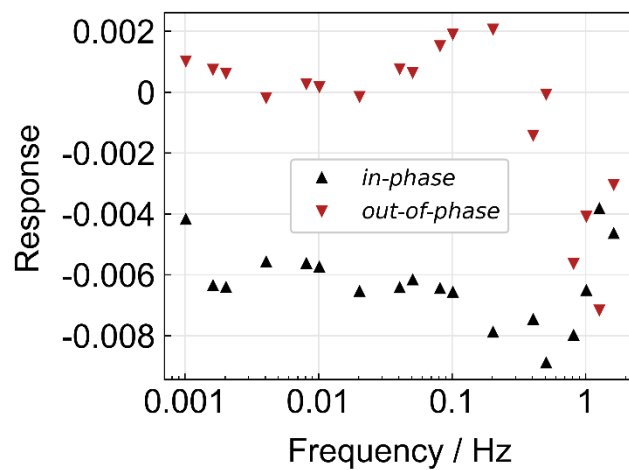


Figure 8: FR spectrum of stainless steel wool/*n*-butane ( $\vartheta = 35\text{ }^{\circ}\text{C}$ ,  $p = 2,3\text{ kPa}$ ,  $m = 356\text{ mg}$ )

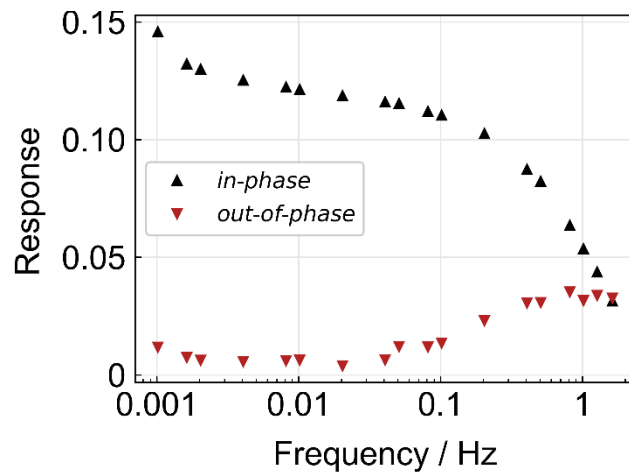


Figure 9: FR spectrum of SZ/propane ( $\vartheta = 36\text{ }^{\circ}\text{C}$ ,  $p = 2,4\text{ kPa}$ ,  $m = 1249\text{ mg}$ )