CO_2 activation on ultrathin ZrO_2 film by H_2O co-adsorption: In situ NAP-XPS and IRAS studies

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Highlights

- Ultrathin ZrO_2 trilayer as model oxide surface
- Pristine surface shows no interaction with CO_2
- Co-adsorption of H_2O activates ZrO_2 for CO_2 adsorption
- adsorbed carbonaceous species identified as formate, dioxymethylene and formaldehyde
- potential methanol activation route on oxide-supported metal catalysts