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Adsorption Temperature Effect on the Thermal Desorption of Oxygen/Zr(0001) Surface

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Isotopic oxygen ($^{18}\text{O}_2$) adsorption on Zr(0001) surfaces at 185 K and 145 K is investigated with AES, LEED and TPD. The surface region of zirconium is saturated by low exposures of oxygen as determined by AES and LEED. However, as the exposure increases, thermal desorption features of H_2^{18}O (20 amu) and H_2^{16}O (18 amu) grow, with more H_2^{16}O than H_2^{18}O desorbing after isotopic oxygen exposure. These results indicate that significant kinetic mixing of surface and subsurface oxygen species as well as hydrogen transport from the bulk is involved in water production by this surface during heating.