Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supplementary information

Low-temperature dissociation of CO_2 molecules on vicinal Cu surfaces

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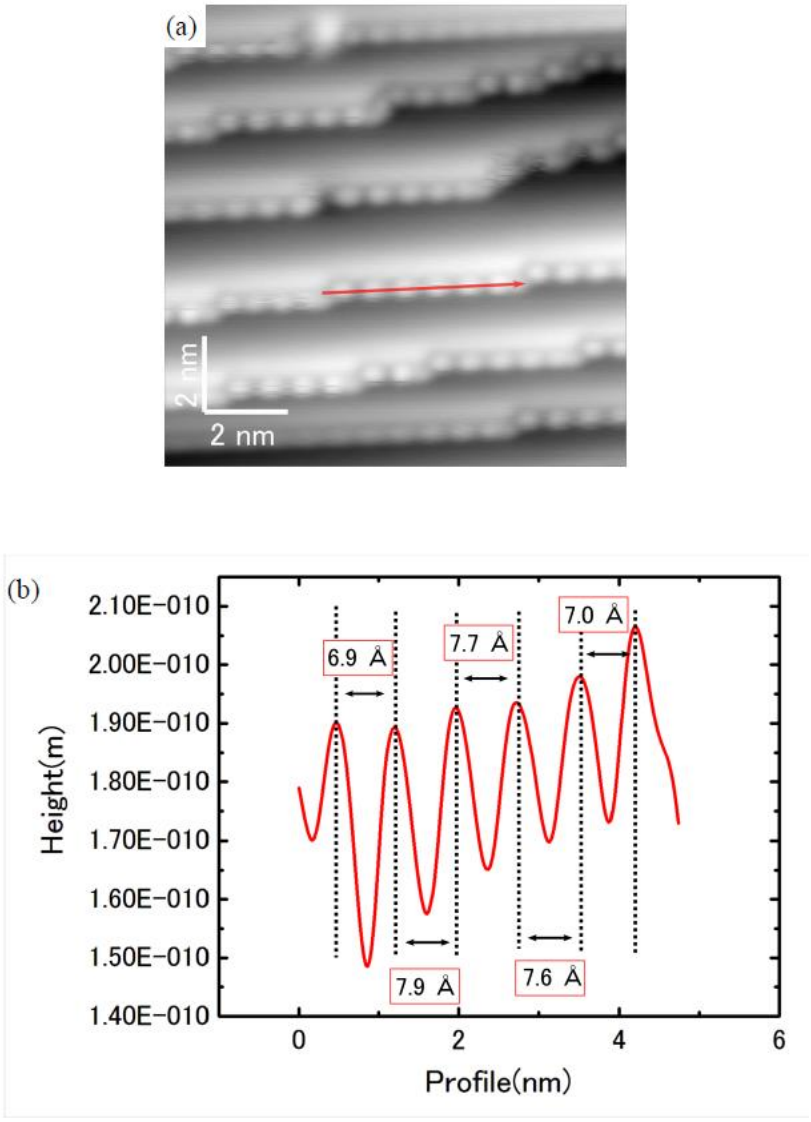

Figure S1. (a) An STM image of Cu(997) after 0.3 L CO exposure at 79 K. *V*s = +0.5 V and *I* = 50 pA. (b) A line profile along a red arrow in (a).

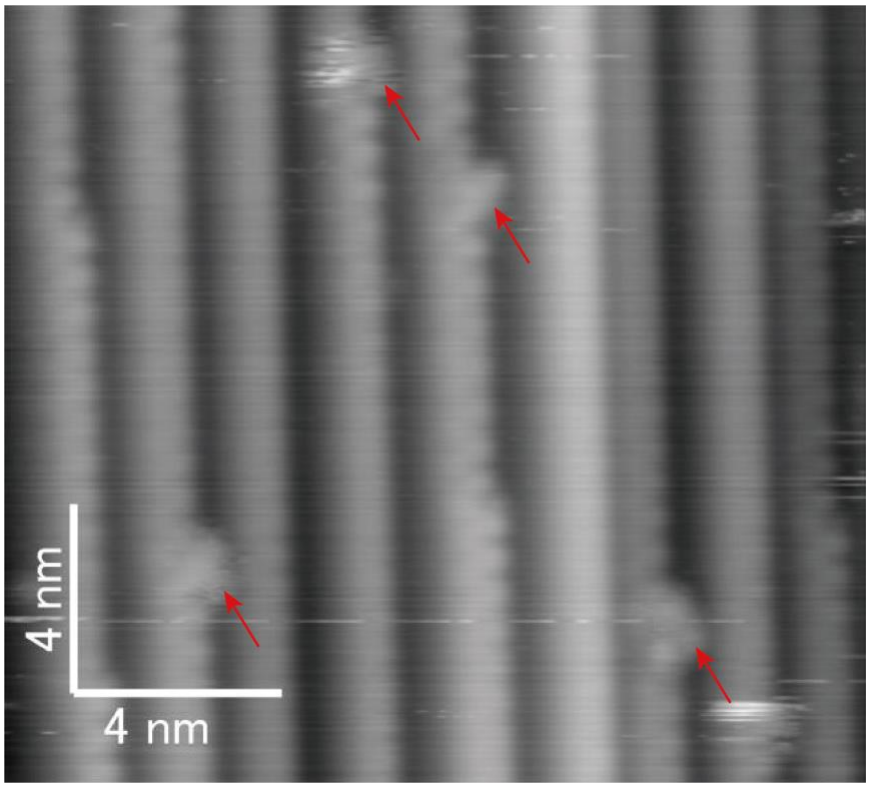

Figure S2. An STM image of Cu(997) after 100 L CO_2 exposure at 92 K. *V*s = +1.0 V and *I* = 50 pA. Red arrows in the figure indicate irregular, fuzzy protrusions at kink sites, which are formed after the CO_2 dissociation reaction.

(a) (b)

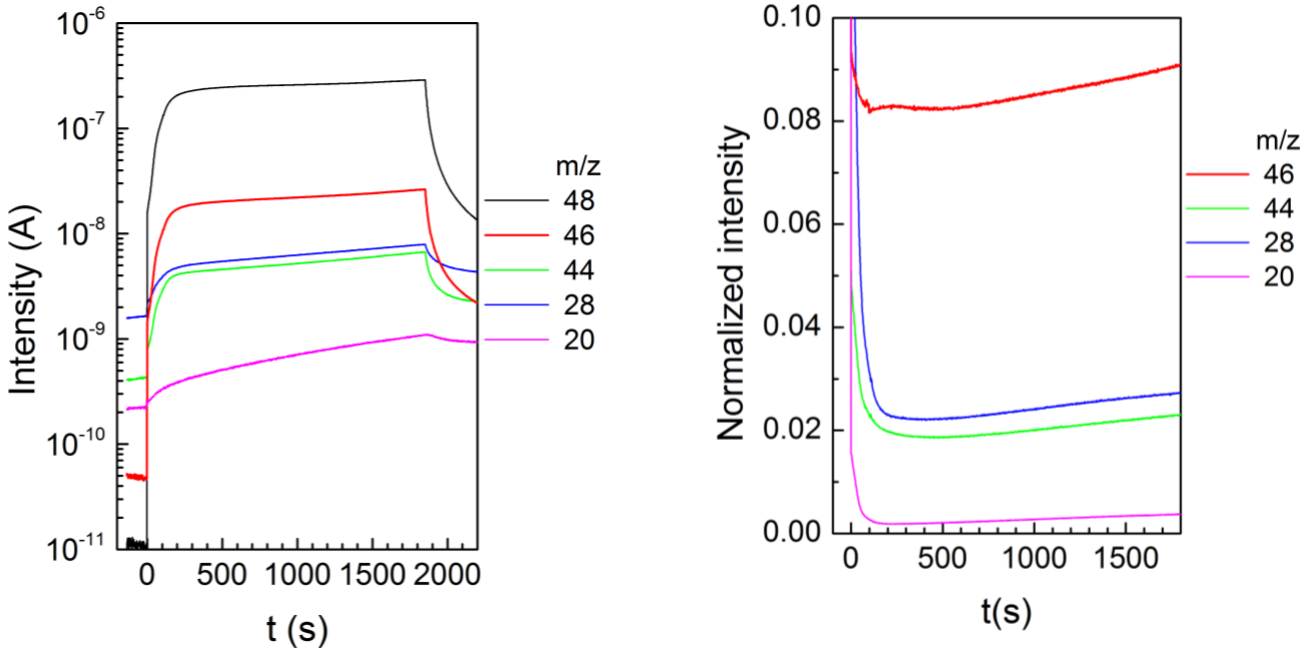

Figure S3. (a) QMS spectra during the $C^{18}O_2$ reaction at a CO_2 pressure of 1.3×10^{-5} Pa on the Cu(997) surface at 82 K as a function of exposure time. (b) Relative QMS intensity normalized by the m/z = 48 signal. The surface was first oppositely oriented from QMS and then faced to QMS at t = 100 s.

(a) (b)

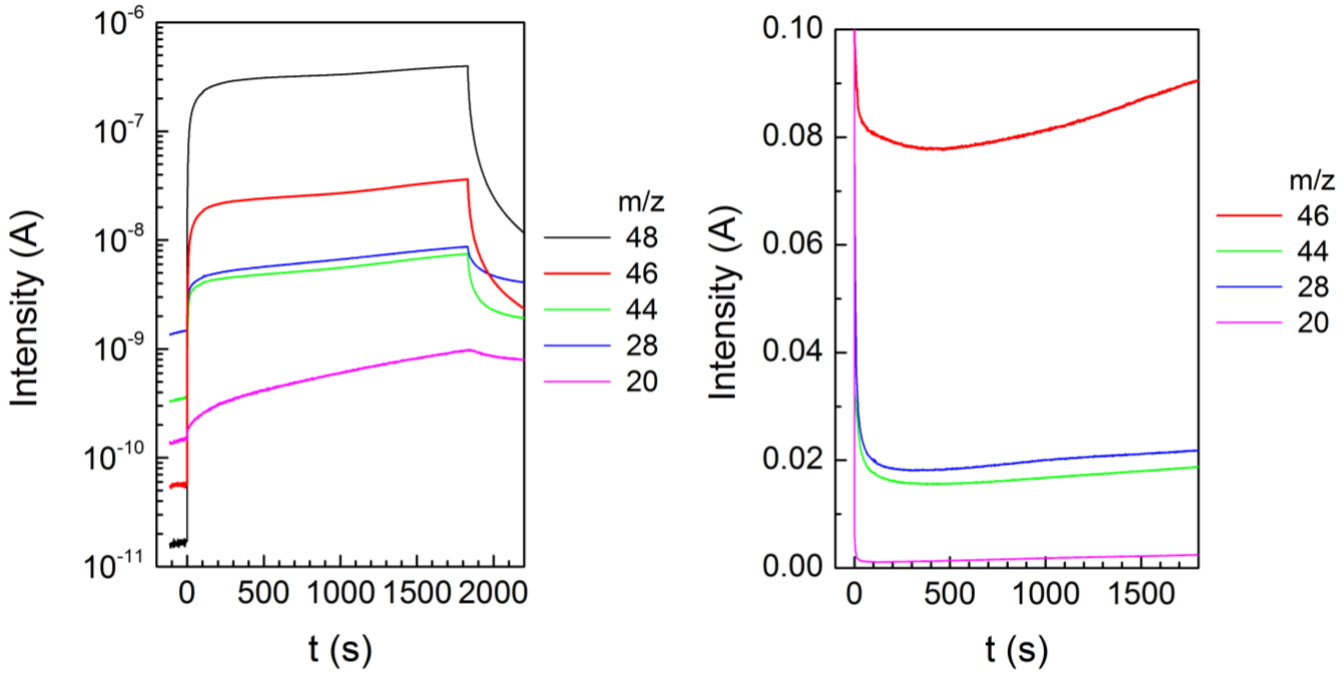

Figure S4. (a) QMS spectra during the $C^{18}O_2$ reaction at a CO_2 pressure of 1.3×10^{-5} Pa on the cyclohexane-covered Cu(997) surface at 82 K as a function of exposure time. (b) Relative QMS intensity normalized by the m/z = 48 signal. The surface was first oppositely oriented from QMS and then faced to QMS at t = 100 s.

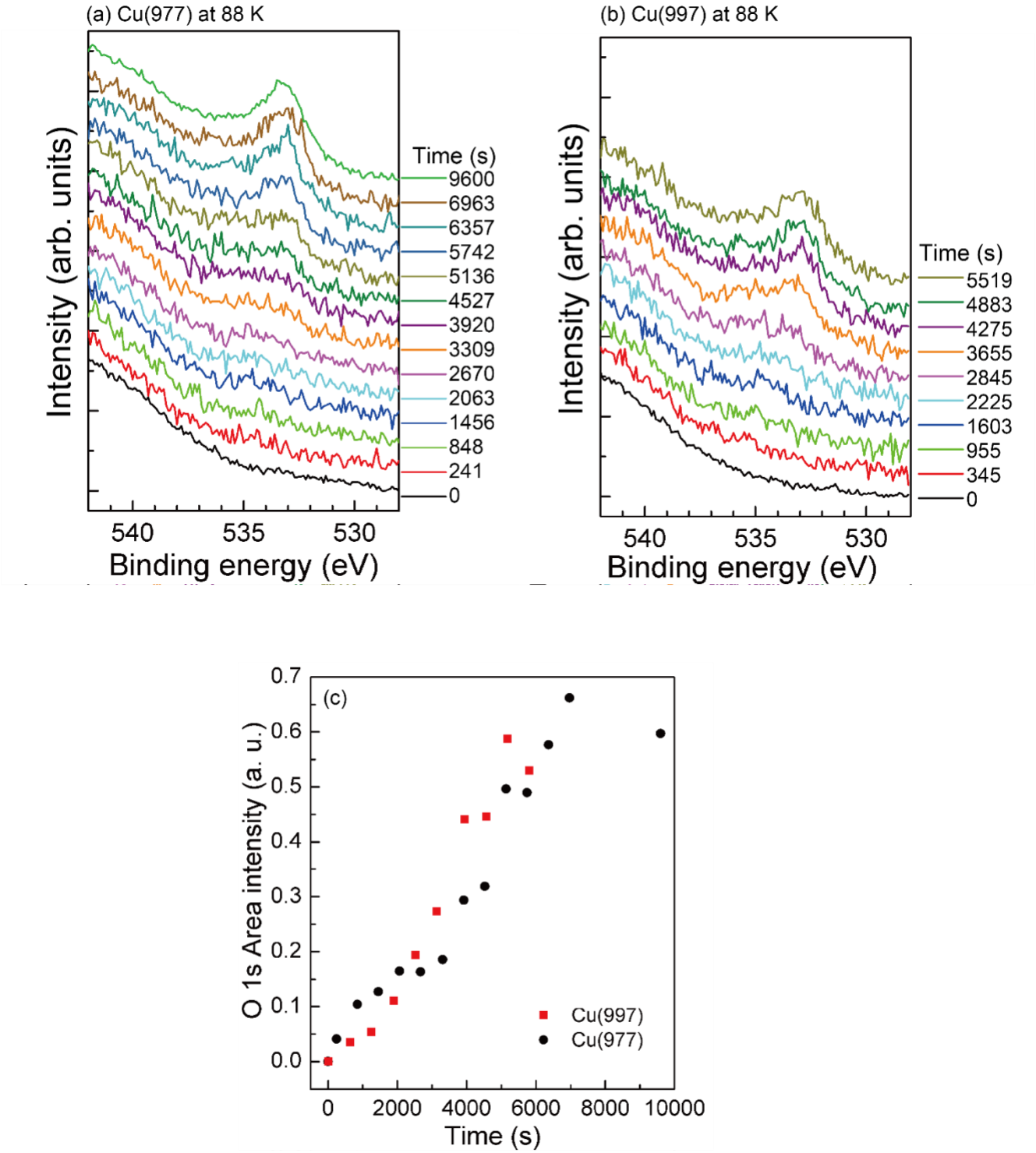

Figure S5. O 1s XPS spectra during the CO_2 reaction at a CO_2 pressure of 3×10^{-6} Pa on (a) Cu(977) and (b) Cu(997) at 88 K as a function of exposure time. (c) O 1s total area intensity of the adsorbates.