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Catalytic C-C bond formation to synthesize carboxylic acids using CO₂

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We have previously sent in our narrative of the work we have accomplished in studying carbon dioxide on a Cu surface. In brief, we had found that CO₂ seemed to promote different selectivity between methyl fragments to from ethane or ethylene. However, we also found that using our XPS, the surface seemed to always be contaminated with either C or O. We thus have spent the last year getting our LEED operational to determine the Cu-O structure on the surface and how carbon dioxide is likely forming carbonates on the surface. After this has been accomplished, we are now in the process of finishing up the work that we have started and initially reported on in our narrative from 2017 and will be wrapping these up for publication in the late fall of 2019.

With these funds, we have been able to finally get our UHV chamber fully operational, including the LEED instrumentation which has not worked until recently. This instrument will be critical to future studies in looking at the cleanliness and order of single crystal surfaces. The student who has been benefitted by this proposal has been able to get a running start on his research dissertation and has been competitive for finding internships elsewhere. The post-doc that was working on this project has successfully started his own independent career as a teaching instructor at a junior college.