Neutral and anionic clusters containing carbon monoxide and carbon dioxide molecules were observed in FTIR matrix isolation spectroscopy experiments following co-deposition of Cu⁺ and Ar⁺ in argon matrices doped with moderate amounts (0.1-1%) of CO₂ and/or CO. Following deposition at 10 K with 0.5% CO₂, peaks for CuCO₂⁻ and Cu(CO₂)₂⁻ were observed, along with a small peak for CO₂⁻ and several bands assigned to neutral (CO₂)x clusters. Upon annealing to 20 K, a new peak appears at 1857 cm⁻¹, which is assigned to the C₂O₄⁻ ion, based on previous work in neon matrices. When CO is added as a dopant (0.5 %) to the matrix gas mix, formation of the anionic copper CO₂ complexes is suppressed, and neutral CO-CO₂ complexes are observed in the spectra, as are bands corresponding to C₂O₃⁻, based on previous studies. Interestingly, the copper carbonyl bands typically observed for equivalent deposition conditions in the absence of CO₂ are strongly suppressed in these spectra. The implication is that complexation with the CO₂ molecules, which are far more abundant in the matrix, inhibits the CO molecules from “finding” the Cu⁺ centers during the matrix formation process. (c.f. ISMS 2014 abstract #P616)

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