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COMMENT

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Comment on the "Reaction intermediates recognized by in situ FTIR spectroscopy in CO_2 hydrogenation over the Cu/ZnO/SPP-zeolite catalyst" by X. Liu *et al.*, *RSC Appl. Interfaces*, 2025, 2, 114

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Frederic C. Meunier

Gaseous CO_2 exhibits hundreds of bands in the mid-IR region due to transitions between excited states and isotopologues. The intensity of these bands are orders of magnitude lower than that of the main features and are often misinterpreted as bands of adsorbates.

Liu *et al.*[1] assigned in situ FTIR bands at *ca.* 2075 cm^{-1} and 2060 cm^{-1} to the stretching vibrations of different carbonyls that bonded to Cu metal surfaces (Cu–C═O) (Fig. 1). This assignment is incorrect, as these bands are merely those of gaseous CO_2 (Fig. 2), which is present in the IR cell. The difference of wavenumber (+/− 2 cm^{-1}) is due to the error on band position at the resolution used. This recurring misinterpretation has already been discussed elsewhere.[2] The authors should thus revise data interpretation and conclusions of their paper in the light of this comment.

CuZn-SPP-E catalyst exposed to flowing CO_2 (A) and then to $CO_2 + 3H_2$ (B) at 150 °C.

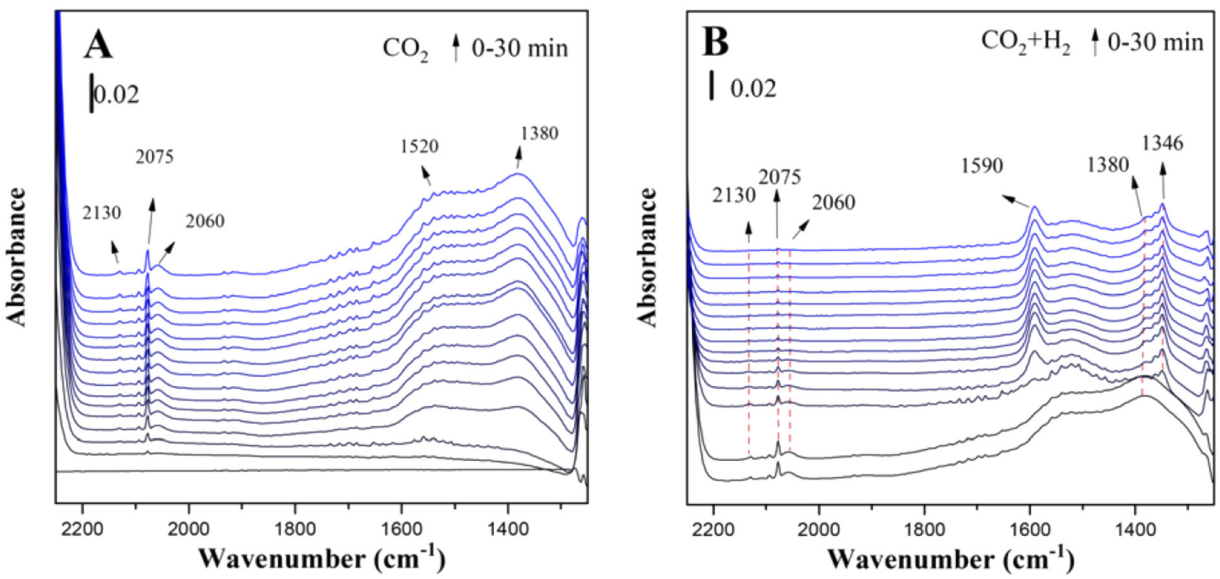

Fig. 1 Reproduction of figure 4 from (ref. 1) describing the in situ FTIR spectra of the reduced.

Université Claude Bernard Lyon, CNRS, IRCELYON, 2 Av. Albert Einstein, 69626 Villeurbanne, France. E-mail: fcm@ircelyon.univ-lyon1.fr

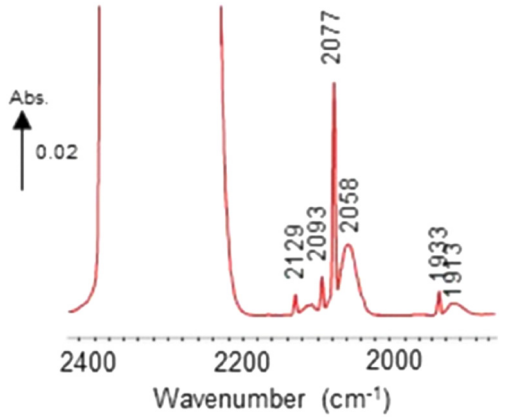

Fig. 2 Gas-phase CO_2 spectrum (reproduced with permission from (ref. 2)).

Data availability

Data will be made available on request to the corresponding author.

Conflicts of interest

There are no conflicts to declare.

References

1 X. Liu, *et al.*, *RSC Appl. Interfaces*, 2025, **2**, 114–121.
2 F. C. Meunier and C. Scarfiello, *Appl. Catal., B*, 2023, **330**, 122610, DOI: **10.1016/j.apcatb.2023.122610**.