Topics in Catalysis (2021) 64:1054–1055
https://doi.org/10.1007/s11244-021-01467-4

RETRACTION NOTE

Retraction Note to: Revisiting the Evolution of IR Spectra of CO Adsorbed on Au Nanoparticles Supported on Non-reducible Supports

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Accepted: 21 June 2021 / Published online: 28 June 2021

Retraction to: Topics in Catalysis (2020) 63:1596–1605 https://doi.org/10.1007/s11244-020-01372-2

The authors have retracted this Article because, after re-examination, some of the results were found to be no longer reliable.

In their article, the authors related the temporal evolution of IR bands of CO adsorbed on Au to a hypothetical reconstruction process. A recent work [1] pointed out that a similar effect could be induced by the presence of nickel through contamination by $Ni(CO)_4$.

The authors re-examined their data and noted that up to 5 ppm of $Ni(CO)_4$ were unexpectedly observed in the effluent gases of the diffuse reflectance FT-IR (DRIFTS) cell that had not previously been noticed. No $Ni(CO)_4$ was detected in the high-purity 5% CO/He from Air Liquide S.A., which had been further purified using a liquid N_2 trap. $Ni(CO)_4$ could also not be detected when CO had been co-fed with O_2 or if the cell reactor had not previously been raised to 300 °C under H_2. The authors conclude that part of the cell (from Harrick) had been corroded, probably by NO_x used during the same period, and reacted with CO to form $Ni(CO)_4$ in situ, only when the nickel present had been reduced to the metallic state.

The authors attempted to reproduce the experiment reported in this Article over the same materials using a new Harrick cell and they could no longer observe the major Au–CO band shift from ca. 2106–2110 cm^{-1} down to 2070–2060 cm^{-1} with concomitant several-fold intensity increase that occurred in less than 10 min (see Figs. 3.A and 6.A). By contrast, they found that the band position and intensity remain constant over 60 min (Fig. 1).

The authors therefore conclude that the spectral evolutions reported in this Article were likely not the result of any restructuring, but rather $Ni(CO)_4$ contamination and deposition of Ni over the Au nanoparticles, leading to Ni-CO species being formed and replacing Au sites.

The authors note that a sample of Au encapsulated in a silicalite-1 zeolite that had been exposed to $Ni(CO)_4$ did not show this band shift, indicating that $Ni(CO)_4$ could not enter the pores of silicalite-1 at 50 °C.

The authors hope that their experience will raise more awareness of the potential pitfalls associated with using CO at low temperatures on corroded steel cells.

All authors agree with this retraction.

The original article can be found online at https://doi.org/10.1007/s11244-020-01372-2.

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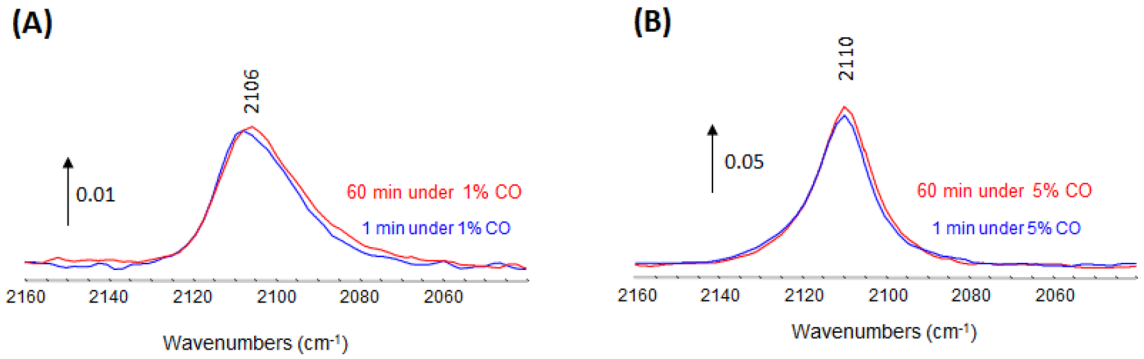

Fig. 1 In situ DRIFTS spectra at 50 °C under 1% or 5% CO/He observed over **A** 2.1% Au/alumina and **B** 1% Au/silica. The samples were pre-reduced in situ with H_2 at 300 °C

Reference

1. Yao Y, Chen L, Mao X, Yang Y, Chen J, Zhou L (2021) J Phys Chem C 125:8606–8619