PROBING THE ADSORPTION OF CARBON MONOXIDE ON TRANSITION METAL CLUSTERS USING IR ACTION SPECTROSCOPY

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The discovery of enhanced catalytic activity of small gold clusters has led to a great interest in size-dependent catalytic properties of metal clusters[a]. To obtain a better understanding of the catalytic mechanisms it is essential to know the structures of these clusters and the nature of their interaction with reactant molecules.

We have studied the structure of gas-phase niobium clusters[b] with a carbon monoxide adsorbed using IR action spectroscopy. We present size-selective IR spectra obtained via IR multiple photon spectroscopy monitoring either photodetachment or photodissociation depending on the charge state. The combination of these spectra with DFT calculations allows for the structural determination of the adsorption product.

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[a] M. Haruta *et al.*, *Journal of Catalysis* **115** 301-309 (1989).
[b] M. Haertelt *et al.*, *The Journal of Physical Chemistry Letters* **2** 1720-1724 (2011)