

Carbon monoxide on ZnO(10-10) Surface: An Infrared Reflection Absorption Spectroscopy study

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One of the most important oxides is zinc oxide (ZnO) according to its semiconducting and optical properties. Numerous IR investigations of oxide powders have been reported^[1], but however, an unambiguous assignment of the features in the complex powder IR spectra recorded for molecules bound to the oxide powder particle is only possible on the basis of data recorded for well-defined reference systems, e.g. surfaces of single crystals.

The different surfaces of ZnO single crystals are used for investigations, both polar Zn- or O-terminated ZnO {0001} and mixed-terminated ZnO(10-10) surface, which is the dominating surface for ZnO powder particles and energetically most favorable. In this study we investigated adsorption of carbon monoxide on ZnO(10-10) surface, which is model system for many reactions in catalysis. Our results give us the information about the orientation of CO on the surface, which is very important for the reaction mechanism^[2].

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[1] H. Noei, C. Woll, M. Muhler, Y. M. Wang, *Appl Catal a-Gen* **2011**, *391*, 31-35.

[2] M. C. Xu, H. Noei, K. Fink, M. Muhler, Y. M. Wang, C. Wöll, *Angew Chem Int Edit* **2012**, *51*, 4731-4734.