

## Dedication to Helmut Knözinger (1935–2014)

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This volume is dedicated to Helmut Knözinger, a leading scientist in the field of characterisation of catalysts by surface spectroscopies and one of the coeditors of *Advances in Catalysis* for many years. I met him for the first time in the mid sixties, when we both were assistant professors in Munich, but at the two different universities. Helmut had performed his thesis work at the Ludwig Maximilians University and then studied the dehydration of alcohols on alumina, thereby continuing the tradition of his famous mentor, Georg-Maria Schwab by being concerned with the aspects of ‘real’ catalysis, while I was working at the Technical University on model systems using the tools of surface science. In 1973 I returned to Munich and became his colleague at the same institute for the next 13 years. Our first collaboration was addressing the question if polynuclear metal carbonyls can be considered as models for chemisorption of CO on metal surfaces, and later he was even the editor (together with his close friend and colleague B.C. Gates and L. Guzzi) of a book on this topic entitled *Metal clusters and catalysis*. A frequently cited paper with the title *Molecular organometallic chemistry on surfaces—reactivity of metal carbonyls on metal oxides* belongs into the same category.

Helmut’s main research topics in catalysis were concerned with the characterization of catalysts by means of infrared and Raman spectroscopies and by the search for correlations between these properties and their catalytic activity. For this purpose he used small probe molecules such as CO, NO, N<sub>2</sub> as well C–H acids which permitted to characterize the surface acid-base properties as well as the oxidation and coordination states of surface metal atoms. The materials investigated cover a wide range of oxides, sulfides, supported metals to

zeolites and solid superacids. With zeolites his studies with systems denoted as *Ship in the bottle* were particularly spectacular. The spreading of oxides over each other (solid–solid wetting) as a method for the preparation of catalysts was another topic of interest for him. His studies comprised a large variety of catalytic reactions such as dehydration, hydroxylation, selective oxidation/reduction, hydrogenation, cracking, isomerization, reforming and hydrodesulfurization.

Helmut published around 400 papers in leading journals, among which there is a review together with P. Ratnasamy entitled *Catalytic aluminas—surface models and characterization of surface sites*. This article appeared in 1978 and has up to now been cited almost 1600 times; it can hence be considered as a real citation superstar.

Beyond our common research interests I had the pleasure to interact with Helmut in the frequent organization of seminars and meetings, among which probably the most important was the 8th International Conference on Catalysis in Berlin in 1984, for which he served as the Scientific Secretary. At such a meeting in 1992 he approached me with the request of a publisher for edition of a *Handbook of Heterogeneous Catalysis*. After some reflection we decided to adopt J. Weitkamp, an expert in the field of zeolites and ‘real’ catalysis as third editor, and started to work on this project which then appeared in 1997 in five volumes. For the publisher this was obviously a success, since after a few years he asked for a second edition. Now F. Schüth agreed to serve as fourth editor and the size expanded to eight volumes which appeared in 2008.

Over the years Helmut received many honours, among which only the Alwin Mittasch Prize and the Ciapetta and Ipatieff Lectureships shall be mentioned. He officially retired in 2000, but remained active until 2011. During this period we still met frequently, either in Munich or Berlin. In January 2014 the catalysis community lost a great scientist and I, together with many others, a good friend.

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