chemisch
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gesellschaft

Gegründet im Jahre 1869 von H. Hlasiwetz,
J. Loschmidt, J. Petzval und J. Stefan

EINLADUNG

zum Vortrag von

Dr. David Lennon

School of Chemistry, University of Glasgow, UK

Vibrational Spectroscopy With Neutrons – New Directions

am

Dienstag, 24. April 2012, um 17:30 Uhr

Ort: Lise-Meitner-Hörsaal, Fakultät für Physik, Universität Wien,
1090 Wien, Strudlhofgasse 4 / Boltzmanngasse 5, 1. Stock

Treppenfreier Zugang: Boltzmanngasse 5, Lift, 1. Stock rechts über den Gang zum Hintereingang des Hörsaals

Abstract:
Inelastic neutron scattering spectroscopy (INS) has enabled vibrational spectra to be measured for over 50 years. Most studies have used a type of spectrometer that is straightforward to build and use and that provides spectra that are not dissimilar to infrared and Raman spectra. This presentation will show the advantages of a type of neutron vibrational spectrometer that has been largely unknown to the spectroscopy community. These instruments are able to access regions of low momentum transfer at relatively large energy transfer. This means that the C–H, N–H, and O–H stretch regions of the vibrational spectrum can be better exploited by INS spectroscopy. The instruments generally have very large detector area, which means that they are significantly more sensitive than the more commonly used instruments. They also allow the energy transfer as a function of momentum transfer to be examined. After briefly outlining the basics of INS spectroscopy, the operational principles of the instruments will be described, showing how flux and resolution can be traded. The advantages of the instruments will then be reviewed to gain understanding of molecular systems in areas as diverse as hydrogen storage, hydrogen bonding, and fullerenes. The instruments are starting to have a significant impact in studies of heterogeneous catalysts and this is illustrated with recent studies of hydrogen on fuel cell catalysts. Finally, some of the constraints linked with catalytic studies will be outlined.