



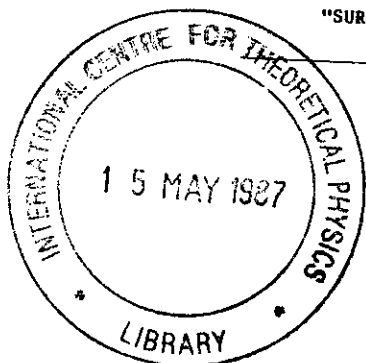
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WORKSHOP ON
"SURFACE SCIENCE AND CATALYSIS"
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ALKALI METAL ADDITIVES

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ALKALI METAL ADDITIVES

OUTLINE

I. Introduction

- Importance of alkali metals as coatings for electron emitters or as promoters in heterogeneous catalysis
- fundamental interest in the adsorption of alkali metals as 'simple' metals in basic research

II. Adsorption of alkali metals on transition metal substrates

- experimental details of alkali metal deposition
- characterization of the alkali metal layer
 - electronic structure: work function change, electron binding energies of core levels, comparison of submonolayer coverages and massive layers (plasmon excitation, electron binding energy shifts, adsorption and sublimation energy)
 - geometric structure: repulsive interaction and long range order, commensurate and incommensurate surface structure, compression structures and rotational epitaxy, phase diagrams

III. Influence of the alkali metal additives on the coadsorption of other gases

- CO coadsorption as a model system

influence of the alkali metal on: the electron core and valence level binding energy (XPS, UPS, IPS, MQQS), C-O stretch frequency and vibrational properties (EELS, IRS), adsorption kinetics and adsorption energy (TDS), dissociation probability, molecular orientation and bond lengths (XPD, ESDIAD, NEXAFS, PARUPS), work function changes ($\Delta\phi$).

- physical picture of the CO-alkali metal interaction

long range versus short range interaction, atomistic models e.g., charge transfer, hybridization, electrostatic interaction.

- special aspects on the coadsorption of other gases: NO, N₂, O₂, H₂O, hydrocarbon.

- comparison of submonolayer and massive alkali metal layer influences on the surface reactivity.

IV. Influence of the alkali metal on surface reactions

UHV model experiments related to the Fischer/Tropsch and Ammonia Synthesis.

V. Outlook

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