Invited Speaker

DIFFUSION AND REACTIONS OF SIMPLE MOLECULES ON Pd(111)

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Using Scanning Tunneling Microsocopy at low temperatures we studied the adsorption and reactions of several small molecules. Using feedback tracking techniques we traced the random walk dsiplacement of molecules (H2O, CO and others) as a function of temperature which allowed us to determine fundamental parameters of the diffusion process. For H2 we found that more than 2 nearest neighboring empty sites of Pd are necessary for dissociation. For CO we found that substrate mediated interactions between molecules extending to at least 3 sites are important and determine the diffusion behavior. Finally, we explored the excitation of translational, rotational and vibration modes of the molecules that lead to enhanced diffusion or reactions.