Knocking on surfaces : interactions of hyperthermal particles with metal surfaces

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Stellingen

behorend bij het proefschrift

Knocking on Surfaces
interactions of hyperthermal particles with metal surfaces

1. Ru(0001) and Ag(111) are structurally very similar. One would imagine that the Ar scattering behaviour from those surfaces is the same. However it is not.
   Chapter 2 of this thesis

2. Hyperthermal Ar atom does act as a stimulator of collision-induced desorption, nevertheless it can also act as a spectator.
   Chapter 3 of this thesis

3. Knowledge of gas-phase collision dynamics is not always helpful in understanding gas-adsorbate interactions.
   Chapter 4 of this thesis

4. A reactive atom, like N used in this thesis, is like a traveller without passport. An excited N atom seems to need a passport.
   Chapter 5 and 6 of this thesis

5. An Al cluster with an odd number of atoms tends to react with ground-state (triplet) O_2 much more slowly than their even-numbered counterparts. This might explain why the sticking probability of O_2 on Al(111) is low.
   *R. Burgert et al., Science **319** (2008) 438*

6. For CH_4 molecule dissociation not only the vibrational excitations but also the steric effects play important roles. The CH_4 molecule is rather a rugby ball than a soccer ball.
   *B. L. Yoder et al., Science **329** (2010) 553*

7. External tensile stress promotes a trapping-mediated reaction process via collective instability in the arrangement of the surface atoms. Apparently a surface reaction can be controlled by stress.
   *M. Yata, Phys. Rev. B **81** (2010) 205402*

8. A FeO(111) film on Pt(111) is active as a CO oxidation catalyst. The importance of trilayer OFeO film formation at high partial pressures of O_2 has been demonstrated by STM and DFT calculations. Nevertheless, to gain fundamental understanding of such structure/morphology, UHV research is necessary.
   *Y-N. Sun et al., Angew. Chem. Int. Ed. **122** (2010) 4520*

9. A non-adiabatic effect in a gas-surface collision can be seen as the motion in a glass of wine during a turbulent flight. The analogy to the role of the moving particle is the dependence of the motion of the wine on the seat and class.

10. The number of replaced copper gaskets is not inversely proportional to the number of experimental results.

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16 november 2010