

Knocking on surfaces: interactions of hyperthermal particles with metal surfaces

Ueta, H.

Citation

Ueta, H. (2010, November 16). *Knocking on surfaces : interactions of hyperthermal particles with metal surfaces.* Retrieved from https://hdl.handle.net/1887/16153

Version: Corrected Publisher's Version

License: License agreement concerning inclusion of doctoral thesis in the

Institutional Repository of the University of Leiden

Downloaded from: https://hdl.handle.net/1887/16153

Note: To cite this publication please use the final published version (if applicable).

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) O₂ much more slowly than their even-numbered counterparts. This might explain why the sticking probability of O₂ on Al(111) is low. *R. Burgert et al.*, *Science* 319 (2008) 438
- 6. For CH₄ molecule dissociation not only the vibrational excitations but also the steric effects play important roles. The CH₄ 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 O₂ 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.

Hirokazu Ueta 16 november 2010