

05.11.2012

Monday 4:00 pm

Physikalische Institute Köln

Lecture Hall III

Zùlpicher Straße 77 | 50937 Köln

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Graphite and Graphene, Low Temperature Catalysts Producing Weakly Excited H₂ Molecules

A model for the low temperature catalysis of hydrogen molecules with low internal excitation on graphite and graphene is proposed: Hydrogen atoms are physisorbed on graphene and transported ballistically to a (barrierless) chemisorbed state at the boundary. A second atom then can produce a molecule via a hot atom or Eley-Rideal process. Since much of the energy is needed to desorb the molecule from the tightly bound chemisorbed state the desorbing molecules have only low internal excitation energy in agreement with astronomical observations.

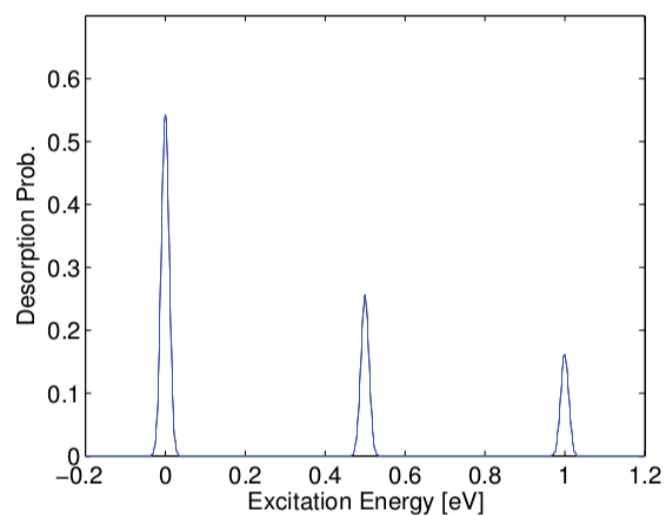


Fig: Dependence of desorption probability on excitation energy [eV] neglecting phonons