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Coverage and velocity dependent sticking coefficient and particle emission kinetics in the Cl_2^{gas} + K^{solid} reaction LARS HELLBERG, BENGT KASEMO, Chalmers University of Technology — Some strongly exothermic and non-adiabatic surface adsorption events, especially those where electronegative molecules adsorb on very electropositive (low work function) surfaces, are accompanied by emission of (exo)electrons, photons, excited atoms and negative ions. The reaction of halogen molecules with halogen surfaces constitute an efficient model system for such studies. We have previously reported data for the emission of negative particles and photons in the zero coverage limit for a range of velocities of Cl_2 molecules impinging on cold potassium surfaces as well as the mechanism behind these emission processes. In the present work, we focus on measurements of the kinetics, i.e. the exposure/coverage dependence, of these processes for the same system. Specifically, we present data for, (i) the separated contributions from electrons and Cl^- ions of the emitted negative particles, (ii) the photon emission stemming both from excited Potassium atoms and from the equivalent process causing electron emission, (iii) the change of the work function during the initial exposure and, finally, (iv) the sticking coefficient for different Cl_2 velocities and exposures.

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