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Study of the influence of collisions between physisorbed atoms on the surface recombination probability VASCO GUERRA, Centro de Física dos Plasmas, Instituto Superior Técnico, 1049-001 Lisboa, Portugal — A dynamical Monte-Carlo method was developed to study the surface kinetics of a simple system. The kinetic scheme comprises physisorption, thermal desorption from physisorption sites, chemisorption, Eley-Rideal recombination, surface diffusion of physisorbed atoms, and Langmuir-Hinshelwood recombination. The model provides the time-evolution of the fractional coverage of both physisorption and chemisorption sites, the recombination probability, and the contribution of each elementary process to recombination. Different grid sizes and averaging procedures were used to optimize the Monte Carlo algorithm. The results were compared with a previously developed mean-field model. The effect of collisions between physisorbed atoms, could not be described within the previous model, was investigated in detail. Evidently, they become important and can change significantly the results in the domain of low surface temperatures, corresponding to a high occupancy of physisorption sites.

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