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Kinetic compensation effect in the thermal desorption of a binary gas mixture NAYELI ZUNIGA-HANSEN, Louisiana State University, LEONARDO E. SILBERT, Southern Illinois University Carbondale, M. MERCEDES CALBI, University of Denver — The kinetic compensation effect, observed in many different areas of science, is the systematic change in the magnitudes of the Arrhenius parameters E_a , the energy of activation and ν , the preexponential factor, as a response to external perturbing parameters. Its existence continues to be debated as it has not been explicitly demonstrated and its physical origins remain poorly understood. As part of a systematic study of different factors that alter the energy of activation during thermal desorption, we have performed numerical studies of the effects of adsorbate-adsorbate interactions on the Arrhenius parameters, as well as the effects of changes in surface morphology. Our results have consistently shown that there is a partial compensation effect between E_a and $\ln \nu$ and a tendency towards isokinetic equilibrium when the system transitions from an interacting to a non-interacting regime. In the present work we study the effects of the presence of two different chemical species. With our systematic study we expect to provide a deeper insight into the microscopic events that originate compensation effects, not only in our system, but also in other fields where these effects have been reported.

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