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Approaches for Argon-Xenon Interaction in Low Pressure Capacitively Coupled Plasmas[1] MAXIMILIAN KLICH, SEBASTIAN WILCZEK, RALF PETER BRINKMANN, Ruhr University Bochum, Bochum, Germany, JESPER JANSSEN, PlasmaMatters B.V., Eindhoven, Netherlands, THOMAS MUSSENBROCK, JAN TRIESCHMANN, Brandenburg University of Technology, Cottbus, Germany — For the simulation of plasma processes, in particular, for industrial applications, often suitable collisional input data is not available. In particular, ion-neutral collision cross sections for ions in non-parent gases are frequently unavailable. The purpose of this contribution is to provide solution concepts to remedy this issue. In order to investigate the influence of different collisional interaction approaches on the discharge, we choose a low pressure capacitively coupled argon-xenon discharge. The main advantage of this choice is its relatively simple chemistry which leads to a feasible number of considered reactions. A PIC/MCC simulation is used with two different approaches to the ion-neutral interaction. An approach based on the Langevin formalism and its capture cross section is compared to an approach that builds on a generalized Lennard-Jones potential. We show that different approaches for the interaction between argon ions and xenon neutrals and vice versa can lead to significantly different results. It is shown that even two approaches which are based on physically sound assumptions can lead to considerably different results. It is argued that particular caution is required concerning the choice of input data in these situations.

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