Introduction to gas phase processes

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Abstract

For including gas phase processes in astrochemical models, two types of information are usually needed: a quantity describing the efficiency of the process, the rate, and the nature of the products resulting of this process. For collisional processes for instance, this is the rate coefficient, expressed in cm3 molec-1 s-1, which depends on the temperature and, in some case, on the density of the environment. Because physical conditions prevailing in the interstellar medium and in low temperature planetary atmospheres are difficult to achieve in the laboratory, experimental and theoretical efforts need to be combined to bring the most accurate measurements and predictions to astrochemical modelers. In this introduction, I will present first the basic concepts of gas phase kinetic processes, then will illustrate the methods used to measure and compute the rate of various processes through recent results with the aim to give to non-specialists tools for a better understanding of the dedicated literature and give them some insights in the difficulties, limitations and perspectives of the current experimental and theoretical approaches.

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