MODELLING OF HYDROGEN IONS WITH H$_2$ GAS

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In this work we present a complete cross sections set and transport properties of hydrogen ions in H$_2$ gas. Ionic charge transfer reactions with molecules are indispensable elementary processes in the modeling of kinetics in terrestrial, industrial and astrophysical plasma in the detection of dark matter. A Monte Carlo simulation method is applied to accurately calculate transport parameters in hydrodynamic regime. We discuss new data for hydrogen ions in H$_2$ gas where the mean energy the flux and bulk values of reduced mobility and other transport coefficients are given as a function of low and moderate reduced electric fields *E/N* (*E*-electric field, *N*-gas density). These data as essential input parameters for modeling various environments. Low temperature can change the state of metals, gases, liquids and solids, cause damage to organisms depending on length of exposure and change the functionality of mechanized processes. Data on swarm coefficients for positive and negative ions are required for hybrid and fluid codes [1, 2] and the current focus on liquids or liquids in rare gas mixtures dictates the need to produce data compatible with these models.

References:

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