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[Poster]

New dataset for planet formation chemistry and modeling

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Abstract: Astrophysical models are fundamental tools for interpreting the molecular composition and evolution of interstellar and circumstellar environments, as well as for constraining their physical conditions. The accuracy and predictive capability of these models strongly depend on the availability and reliability of molecular databases and reaction-rate coefficients obtained from both theoretical calculations and laboratory measurements. In this context, comprehensive and accessible atomic and molecular datasets, including resources such as VAMDC, are essential for developing and improving models of molecular processes relevant to star and planet formation. Particular attention is required for molecular ions, whose radiative and collisional processes can significantly influence the chemical balance and abundance of species in astrophysical environments. Among these processes, dissociative recombination plays an important role in determining the survival and destruction pathways of molecular ions. In this work, we calculate, assess, and analyze cross sections and rate coefficients for selected molecular ions, with particular emphasis on hydrogen- and helium-containing systems. The calculations are performed for a

range of model parameters to investigate their dependence on the physical conditions and to provide reliable data for incorporation into astrochemical and astrophysical modeling databases.

Keywords: data, modeling, planets

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