



Dynamics of atom-diatom reactions at the low energy regime

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The dynamics of some atom-diatom reactions has been investigated in the low collision energy regime ($E_{\text{coll}} < 10^{-1}$ eV). The possibility of complex-forming mechanisms is analyzed by means of a statistical quantum method [1,2] in comparison with quantum mechanical results and experimental measurements. The case of the $\text{H}^+ + \text{H}_2$ reaction, and isotopic variants, for which a significant dependence on the energy range has been reported before, is treated in detail [3]. Recent studies on the $\text{D}^+ + \text{H}_2$ reaction found theoretical rate coefficients in a good agreement with experiment down to 10^{-3} eV [4,5]. Similar investigations in other reactions such as $\text{Li} + \text{YbLi}$ and $\text{He} + \text{NeH}^+$ [6] are discussed.

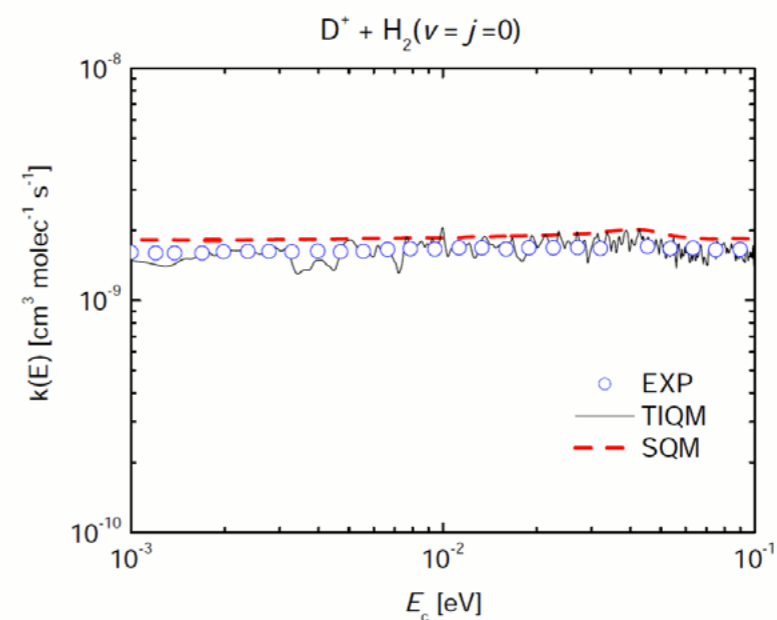


Figure 1. Rate coefficient for the $\text{D}^+ + \text{H}_2 \rightarrow \text{HD} + \text{H}$ reaction. A comparison of statistical, time independent quantum mechanical and experimental results.

References

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