
Electron collision driven chemistry

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Résumé

Electrons are both efficient exciters of molecular modes and can drive molecular dissociation. I will report on recent calculations performed in my group studying electron collisions with small molecules. These include:

1. Rotational excitation of interstellar molecular ions. Recent work has focused on rotational excitation rates for the newly discovered argonium ion (ArH⁺) as well as re-evaluation of rates for electron collisions with CH⁺ and HeH⁺.
2. Dissociative recombination of N₂⁺. A very extensive study of this system, which is particularly hard to perform measurements on, provides low-energy cross sections as a function of N₂⁺ vibrational state.
3. Vibrational excitation cross sections for CO, NO, N₂ and O₂. As part of the EU-funded Phys4Entry project, comprehensive datasets of vibrational excitation cross sections have been calculated which consider excitation/dexcitation from all target vibrational states.
4. Dissociative electron attachment and electron impact dissociation of O₂ has been considered as a function of O₂ vibrational states.

These results will be summarised at the meeting.

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