Electron Cooling by Vibrational Excitation of Carbon Dioxide

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Abstract

We report new results for electron energy transfer rates [1] and electron cooling rates due to vibrational excitation of carbon dioxide (CO_2). The present model calculations are topical because at altitudes less than about 200 km, the neutral atmospheres of Mars and Venus are dominated by CO_2. Thus we expect electron cooling by CO_2 to be a significant energy transfer mechanism in their respective atmospheres, with vibrational excitation being the dominant process [2].

Our method was described earlier in Campbell *et al.* [1], although in this application our integral cross section (ICS) database has been meticulously constructed from the best available experimental and theoretical [e.g. 3-5] ICS for vibrational excitation in CO_2. Electron energy transfer rates from the present work are compared against those from the only previous corresponding study [2], with these results being presented at the meeting.

References

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