Cross sections for electron scattering by dimethyl-ether

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During the recent years, global-warming has become one of the most serious public concern over the world. Since the use of renewable energy sources replacing the fossil fuels can minimize or delay such effects, it is becoming top priority. Small organic compounds are some potential candidates for this purpose. Particularly, dimethyl-ether (DME), which is extracted from jathropha seeds, constitutes an interesting alternative for diesel engines due to its high cetane number and overall low sooting and low polluting properties [1,2] In this regard, absolute cross sections (CSs) for e^--DME collisions are key physical quantities for the understanding of ignition process of DME combustion.

In this work we report a joint experimental-theoretical study for e^--DME scattering. Measured elastic CSs obtained via the relative-flow technique are reported in the 100-1000 eV energy range. Also several theoretical CSs calculated at the static-exchange-polarization-absorption level of approximation are reported in the 1-500 eV range. In Fig. 1 we show our theoretical differential cross sections (DCS) for elastic e^--DME scattering at 100 eV in comparison with the present experimental data. DCS for e^--ethanol [3], an isomer of DME, is also shown. Additional results will be presented at the Conference.

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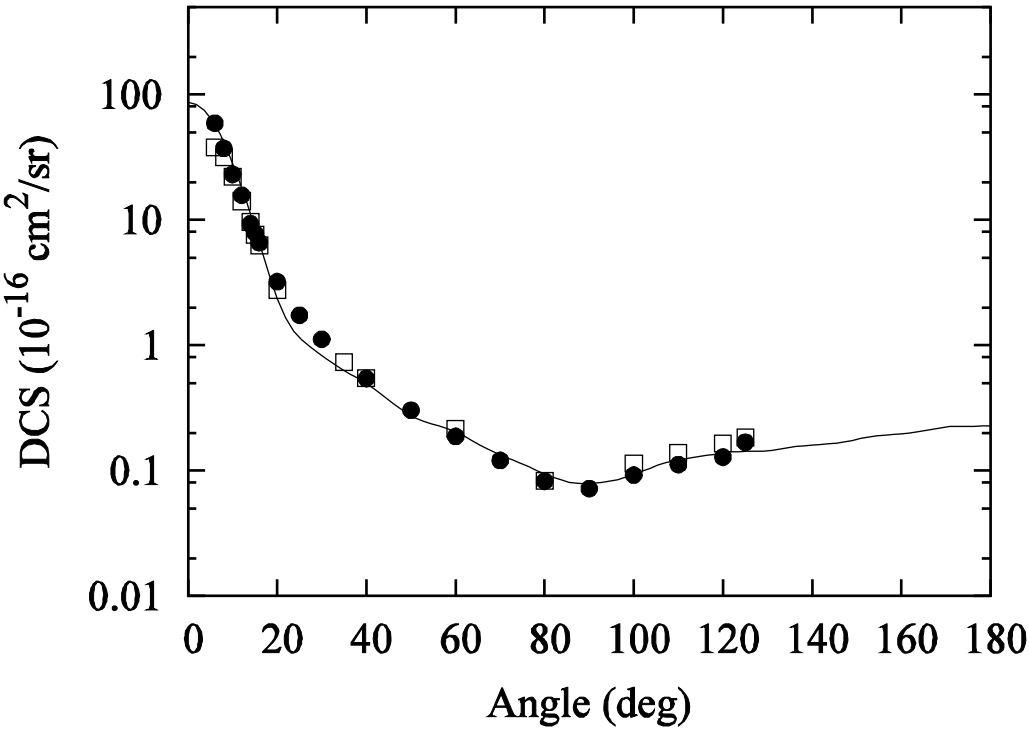

Fig. 1: DCS for elastic e^--DME scattering at 100 eV. Solid line; present calculated results; full circles, present experimental data; open squares, experimental data for e^--ethanol scattering [3].

References

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