$Si_3O_2^+$ - OPTICAL ABSORPTION AND PHOTODISSOCIATION PROPERTIES

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Interstellar dust is an essential constituent in the evolution of solar systems, stars, and planets - like our Earth - but its origin and processes are still insufficiently understood. Key components of such interstellar dust are μm-sized silicates, which are mainly silicon-containing compounds, with oxygen, among others.[1] Furthermore, silicon and oxygen are the two most abundant elements in our Earth's crust. However, only molecular SiO has been identified as a possible precursor in space and circumstellar disks yet.[2] Experimental data and quantum chemical calculations on larger $Si_nO_m^+$ cations are expected to provide information on further intermediate steps of the dust grain formation. Therefore, we focus on these and present the first results on the $Si_3O_2^+$ molecular ion. The optical spectra are among the first spectroscopic information for $Si_nO_m^+$ cations larger than SiO^+ and Si_2^+.[2–5] The electronic photodissociation spectra are obtained by photodissociation spectroscopy of mass-selected ions in a tandem mass spectrometer coupled to a laser vaporization source.[6] The data generated by action spectroscopy are compared and interpreted with TD-DFT calculations.

Literature:
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