

Abstract Submitted
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Multiple ionisation of pyrimidine by electron impact – coincidence measurements of the dissociation of a “prebiotic” molecule¹ LILIAN ELLIS-GIBBINGS, ELEANOR SMITH, STEPHEN D. PRICE, University College London — Pyrimidine has long been utilized as a straightforward molecule that displays similar dynamics to the DNA and RNA bases uracil, cytosine, and thymine¹. Spectroscopic searches for pyrimidine² in the interstellar medium are ongoing. Formed *via* ionization in energetic environments, molecular dications often dissociate with high kinetic energy releases. Ion-molecule interactions³ are a significant avenue for research into prebiotic molecule synthesis in the interstellar environment. For its relevance to prebiotic astro-chemistry, we present a study of the electron ionization of pyrimidine with ion-ion coincidence mass spectrometry. Aside from producing accurate branching ratios, the technique can determine precursor-specific partial ionization cross sections and the proportion of multiple ionization processes for a range of electron collision energies (50-200 eV). The coincidence data is unusually rich indicating a high incidence of dissociative double ionization. 100+ pairs are seen in the ion-ion coincidence spectrum, from double and triple ionization. 1 L Ellis-Gibbings, AD Bass, P Cloutier, G García, and L Sanche, PCCP. 19, 13038 (2017) 2 ZC Wang, CA Cole, TP Snow, and VM Bierbaum, Astrophys. J. 798, 4 (2015) 3 EF van Dishoeck, in Astrochem. VII - Through Cosm. (2017), pp. 1–20

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