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ABSOLUTE CROSS SECTIONS FOR THE FRAGMENTATION OF BIOLOGICALY RELEVANT MOLECULES AFTER IONISATION

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The advent of heavy ions for cancer therapy has emphasised the need for novel dosimetric concepts that ideally should also account for the biological effectiveness of radiation. One approach to obtain such new dosimetric concepts is the field of nanodosimetry, where the particle track structure is taken into account by measurement [1] or by simulation [2] of ionisation cluster size distributions. The damage to DNA in the form of double strand breaks can be estimated from these distributions by means of phenomenological models that contain adjustable parameters, such as the conditional probability for an ionisation of the DNA molecule to result in a strand break [3].

In principle, the induction of a strand break due to an ionisation cluster in a DNA-segment could be modelled without free parameters if the cross sections for fragmentation of the molecular building blocks of the DNA backbone were known.

In the present work, we show the first results from our crossed-beam experiment [4] for the absolute fragmentation cross sections after electron induced ionisation. Measurements have been made with electrons in the energy range of (50 –500) eV irradiating supersonic jet targets of propane [5], methanol and tetrahydrofuran.

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