

## THE THRESHOLD PHOTOELECTRON-PHOTOION COINCIDENCE SPECTROSCOPY OF VINYL BROMIDE (C<sub>2</sub>H<sub>3</sub>Br).

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Our research project is mainly focused on the ionisation and dissociation dynamics of halogenoethylene isolated ions and clusters. We have already investigated the 1,1-difluoroethylene [1,2] and reported the spectroscopic study of vinyl bromide [3]. In the present contribution we will present our first results on the investigation of the dissociative photoionisation of the bromoethylene (C<sub>2</sub>H<sub>3</sub>Br) molecule.

The present work was performed on the 3m-NIM-1 beamline at the synchrotron radiation facility BESSY. The light is dispersed on a 2400 1/mm grating and focused in the center of the ionisation chamber. Threshold photoelectrons are selected by a steradiancy analyser, while ions produced in coincidence with the detected photoelectrons are analysed by means of a time-of-flight (TOF) spectrometer. A typical coincidence time of flight spectrum is shown in figure 1.

The breakdown graph for the most important decay channels of ionised vinyl bromide are presented in figure 2. The most interesting feature observed is the sudden increase in the yield of the C<sub>2</sub>H<sub>2</sub><sup>+</sup> ions at about 16 eV photon energy. This could be explained by the possibility for a C<sub>2</sub>H<sub>3</sub>Br ion produced at this energy to lose sequentially a Br and a H atom. Indeed the observed threshold agrees with the opening of that dissociation channel.

We are currently using these breakdown diagram data in the analysis by the maximum entropy method of the kinetic energy released on the bromine loss reaction C<sub>2</sub>H<sub>3</sub>Br<sup>+</sup> → C<sub>2</sub>H<sub>3</sub><sup>+</sup> + Br.

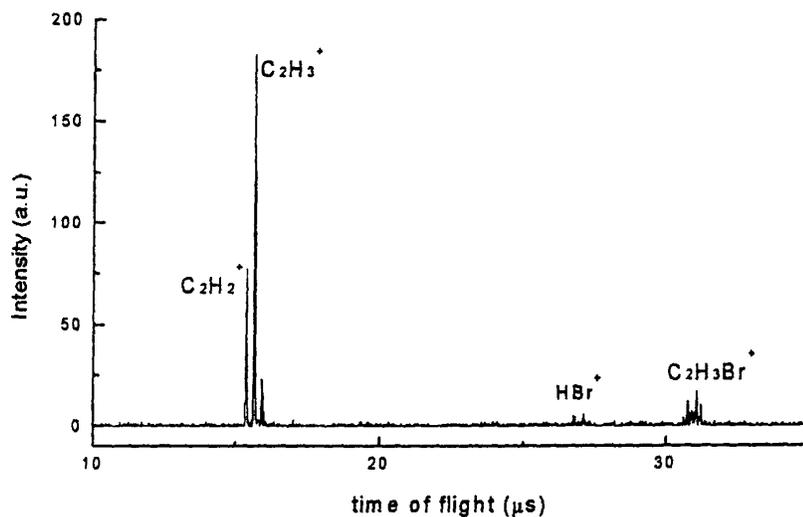
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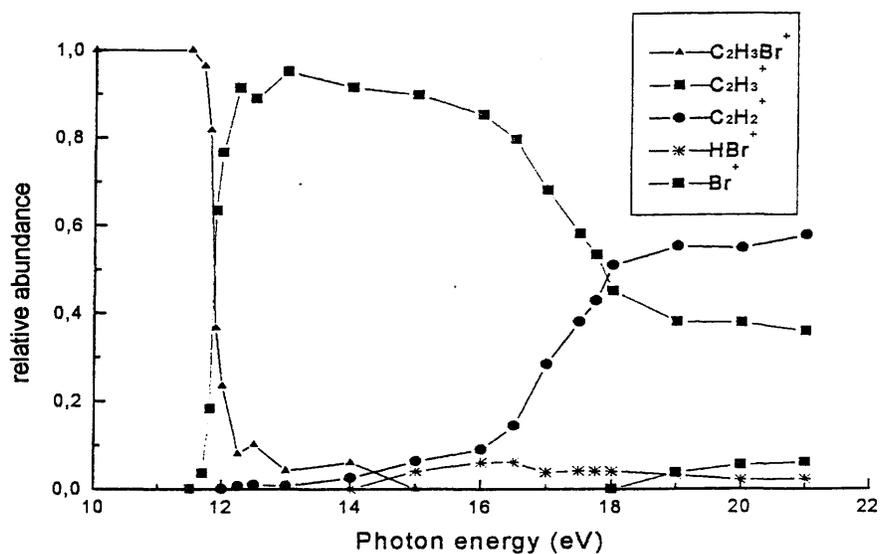
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**Fig. 1:** The TPEPICO-TOF spectrum of monobromoethylene recorded at 17 eV photon energy.



**Fig. 2:** The TPEPICO breakdown curves of  $C_2H_3Br$



## References.

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