Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting Information for

Electron-induced fragmentation mechanisms in organic monomers and their implications on photoresist optimizations for EUV lithography

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1. Film-phase electron-induced fragmentation analysis of MIB

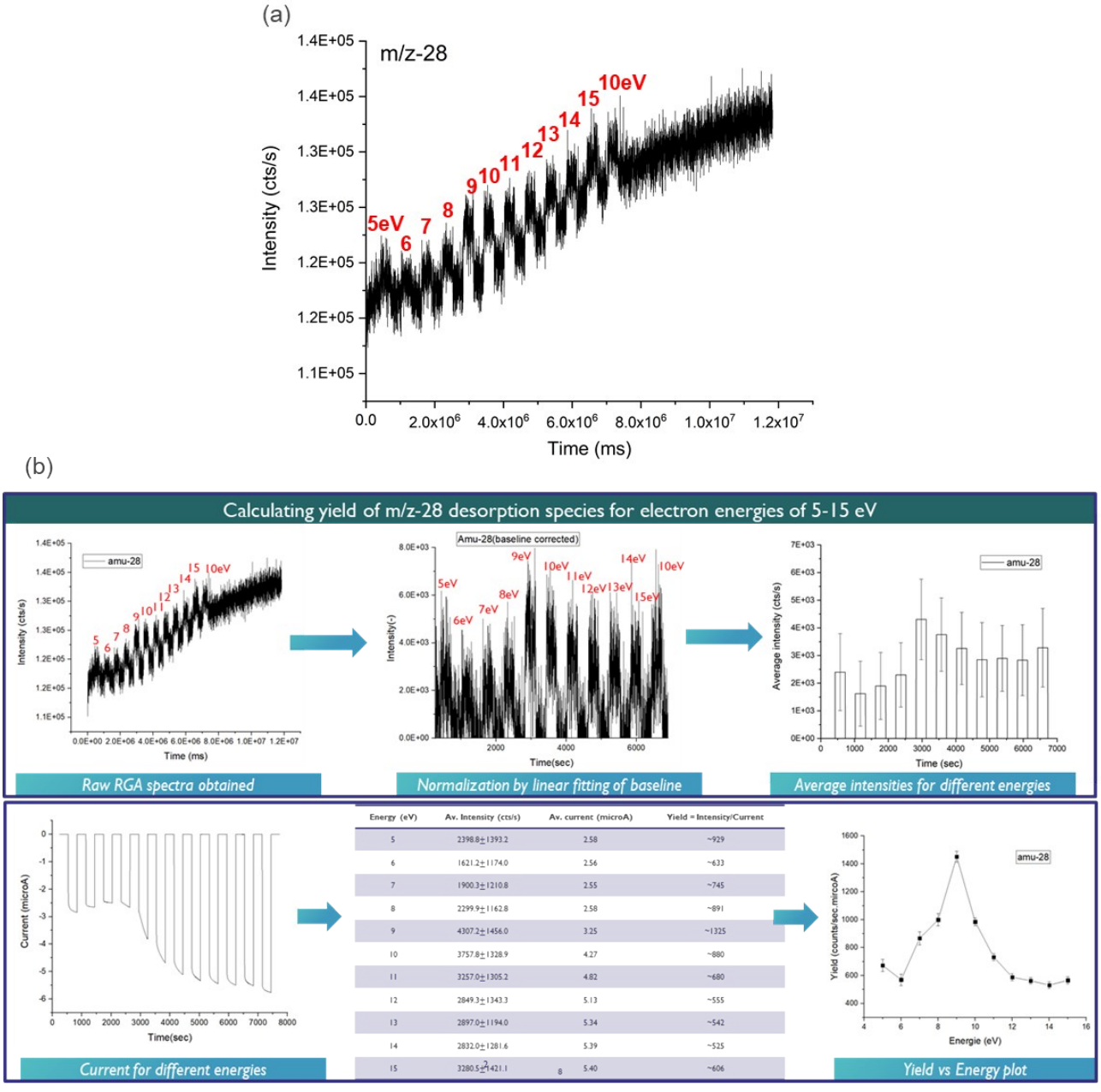


Fig S1. *(a) Raw RGA spectra (intensity versus time) of m/z-28 obtained during the 5-15 eV ESD experiment. (b) Methodology to calculate yield versus energy plot for m/z-28 from the raw RGA spectra.*

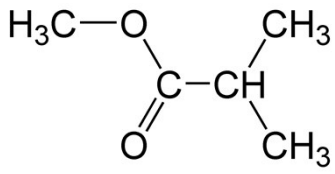
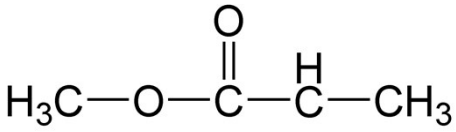
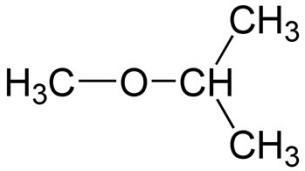
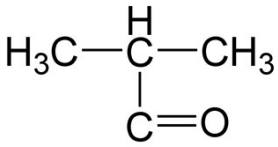
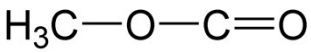
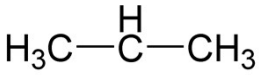
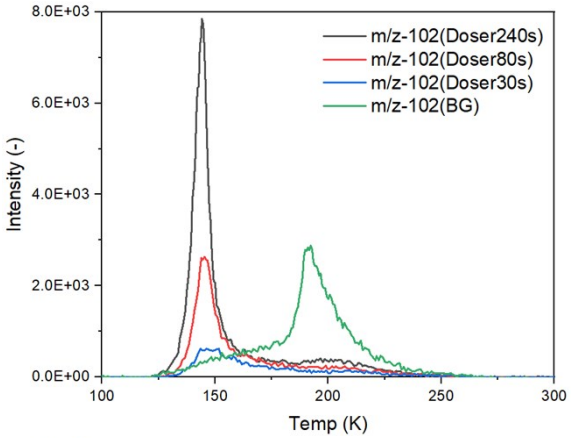
m/z – 102 (Parent molecule) 	**m/z – 87 (CH_3 loss)** 
m/z – 74 (CO loss) 	**m/z – 71 (CH_3O loss)** 
m/z – 59 (CH_3CHCH_3 loss) 	**m/z – 43 (CH_3CHCH_3)-cation** 

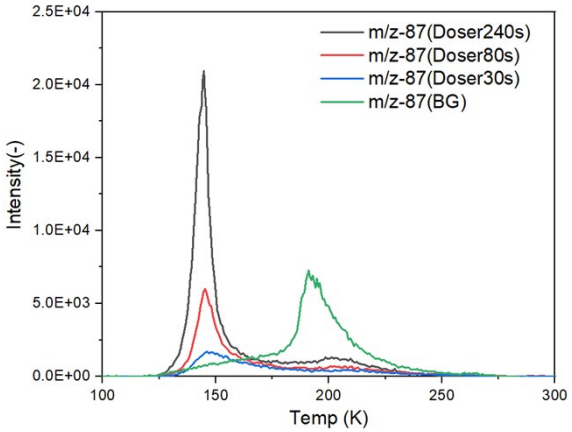
Fig S2. *Structures of positive-ion fragments from 70 eV mass spectra obtained for MIB.*

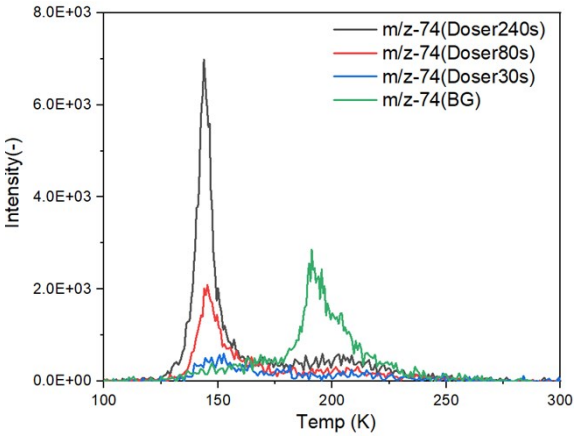
M/z	Rel. intensity % (NIST database)	Rel. intensity % (this study)
102	18	19
87	19	22
74	4	6
71	40	42
59	21	25
43	100	100
41	30	52

Fig S3. *Comparison of the relative intensities of important m/z ratios obtained for MIB for this study with the NIST database. The lower m/z range, i.e., below about m/z 43, is dominated by the contribution from residual gas in the chamber*

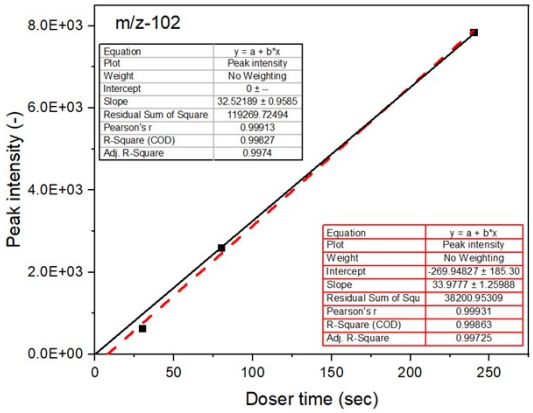
TPD of desorption masses

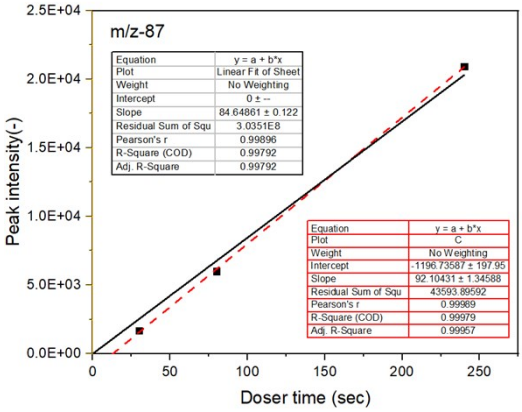


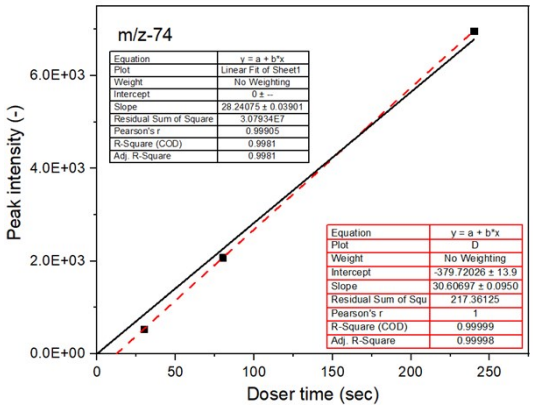




Calibration curve







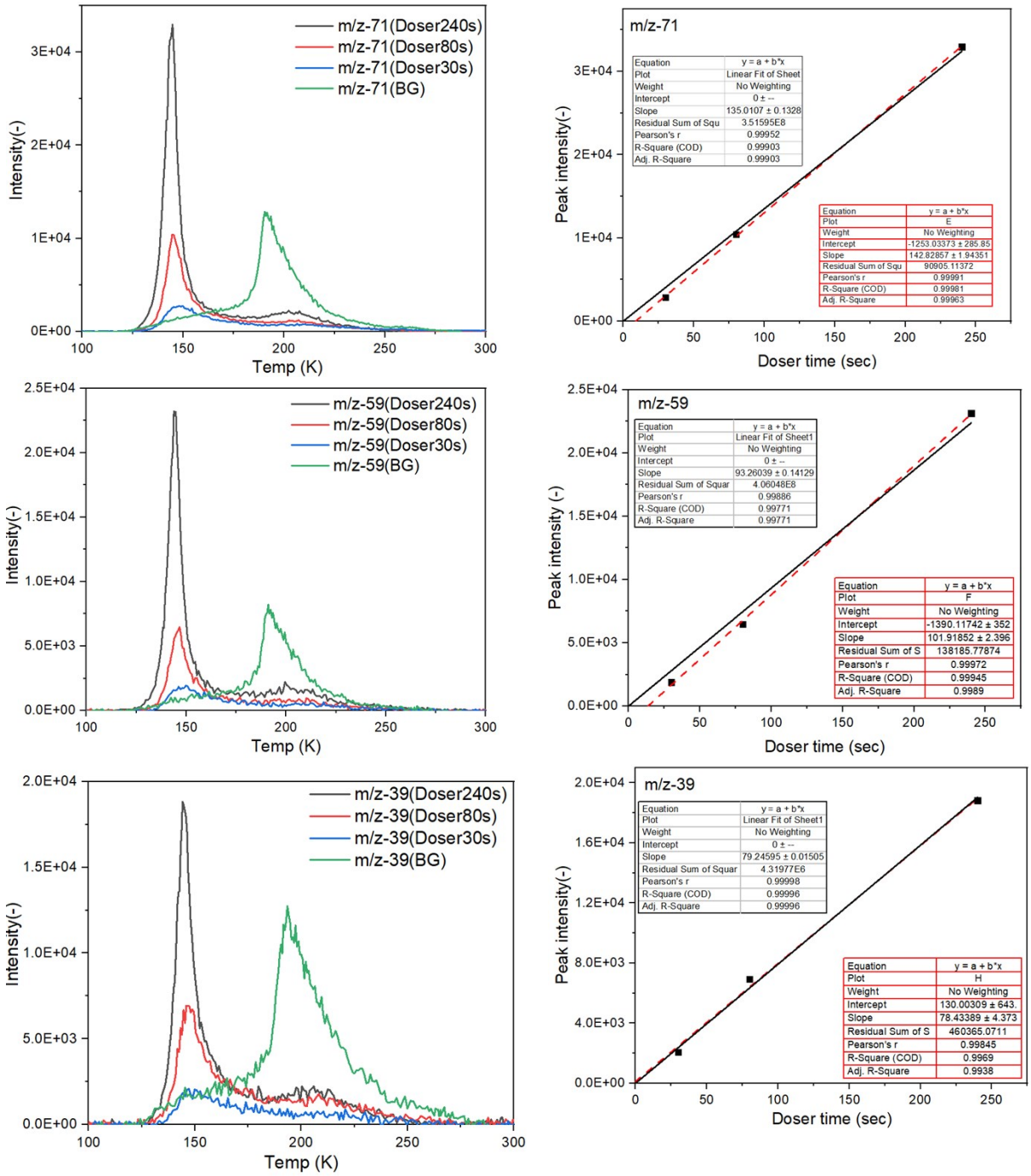


Fig S4. *TPD (left) and calibration curves (right) of desorption masses of amu-102, 87, 74, 71, 59, and 39 of MIB monomer. The intensity profile of the background (BG) deposition is also provided in green (deposited at a partial pressure of 2E-9 mbar).*