**Supporting** **Information** **For:**

**Resonance-Enhanced Multiphoton Ionization Spectroscopy of Mono- and Polycyclic Aromatic Hydrocarbons in the Gas Phase**

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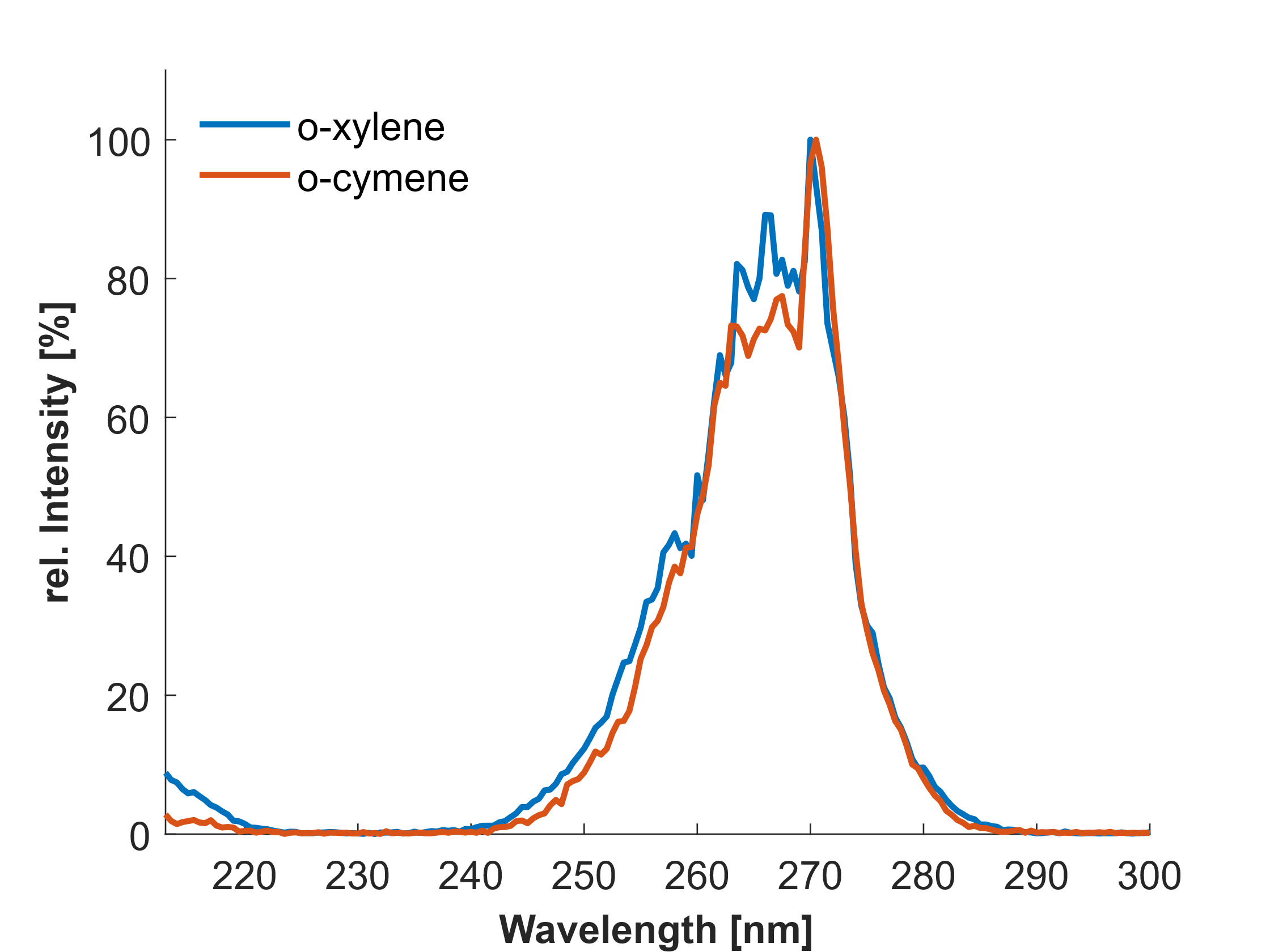
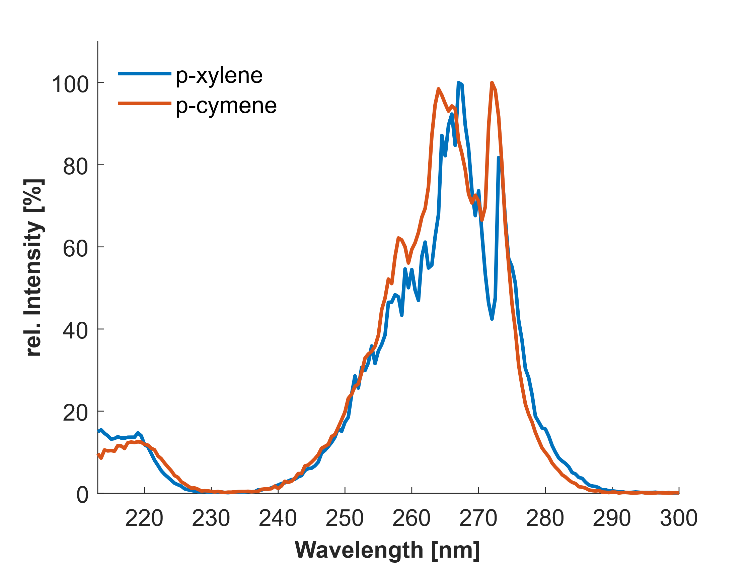


Figure S1 Investigation of the influence of the size of alkyl groups. (A) Ortho-xylene, containing two methyl groups, and ortho-cymene, containing one methyl and one isopropyl group. (B) Para-xylene, containing two methyl groups, and para-cymene, containing one methyl and one isopropyl group.

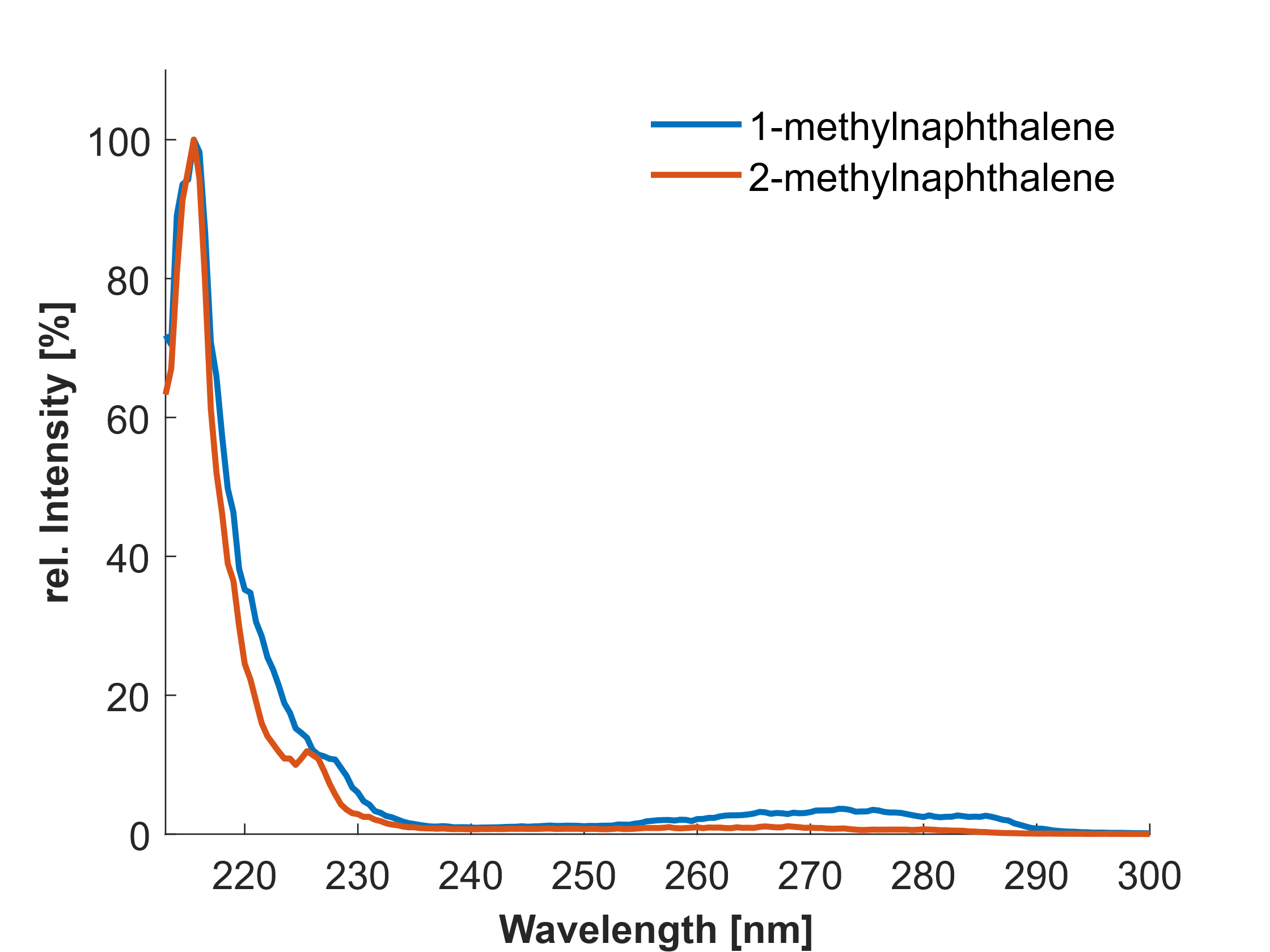
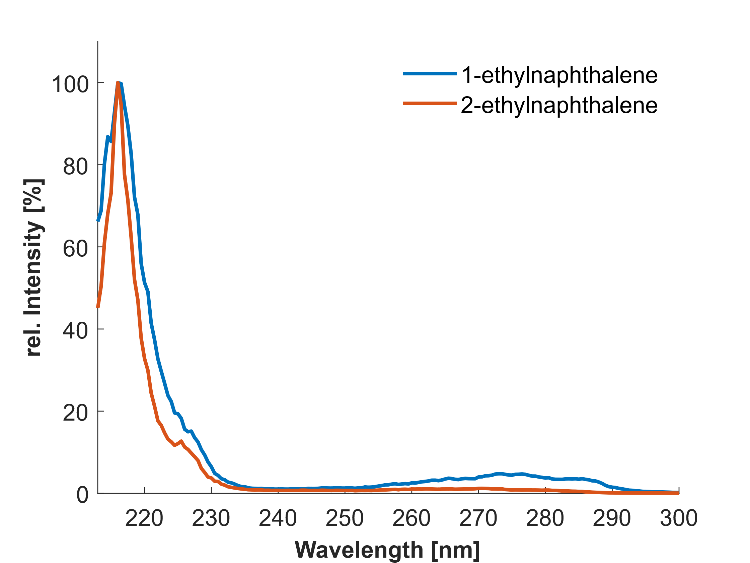


Figure S2 Investigation of the influence of the position of alkyl groups. (A) Methyl-substituted naphthalene on the α-position (1-MN) compared to the β-position (2-MN). (B) Ethyl-substituted naphthalene on the α-position (1-EN) compared to the β-position (2-EN).

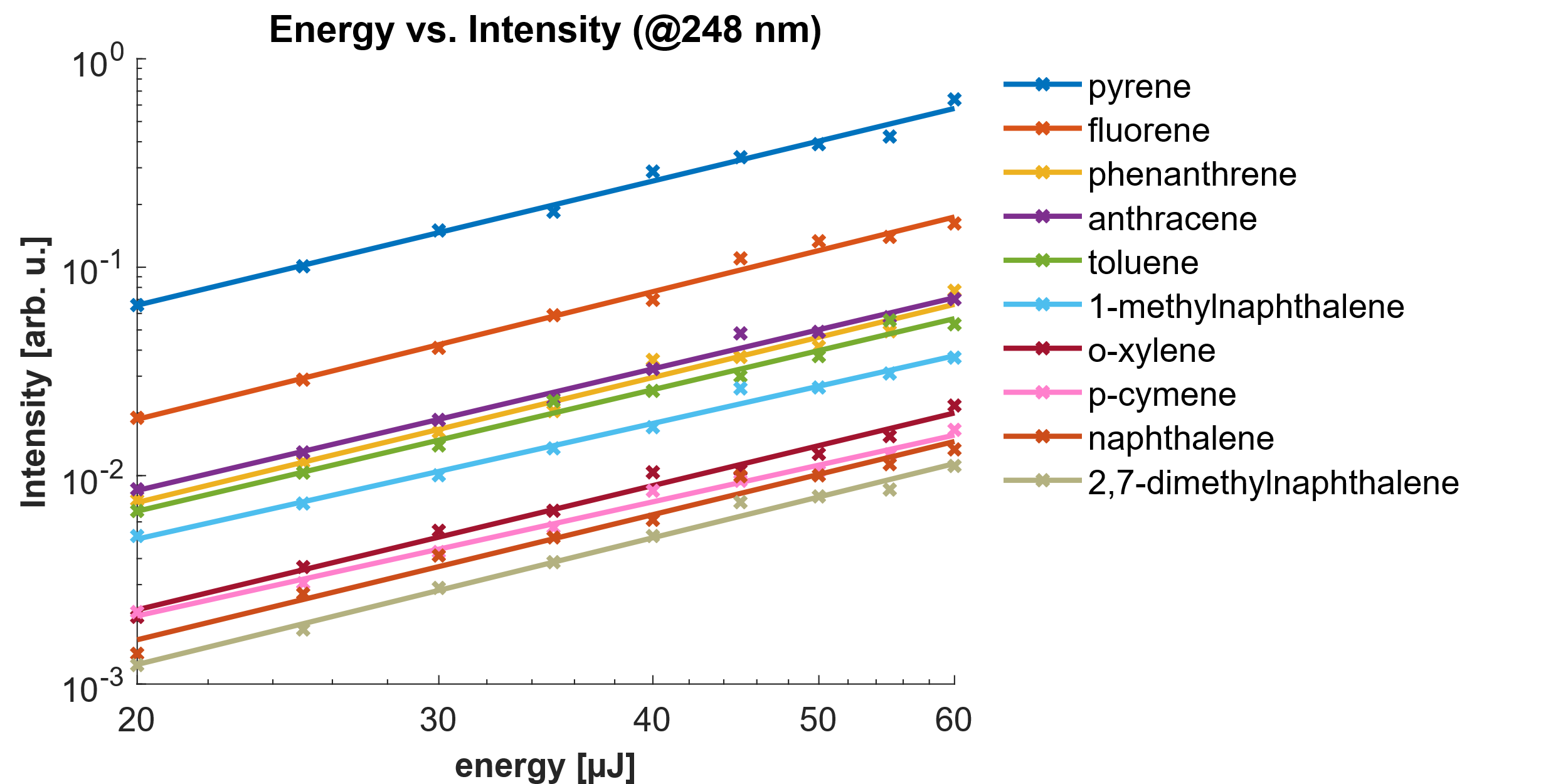


Figure S3 The dependence of the intensity on the laser energy for several compounds in the wavelength range from 20 to 60 µJ at a wavelength of 248 nm for the determination of the exponents for the calculation of the relPICS.

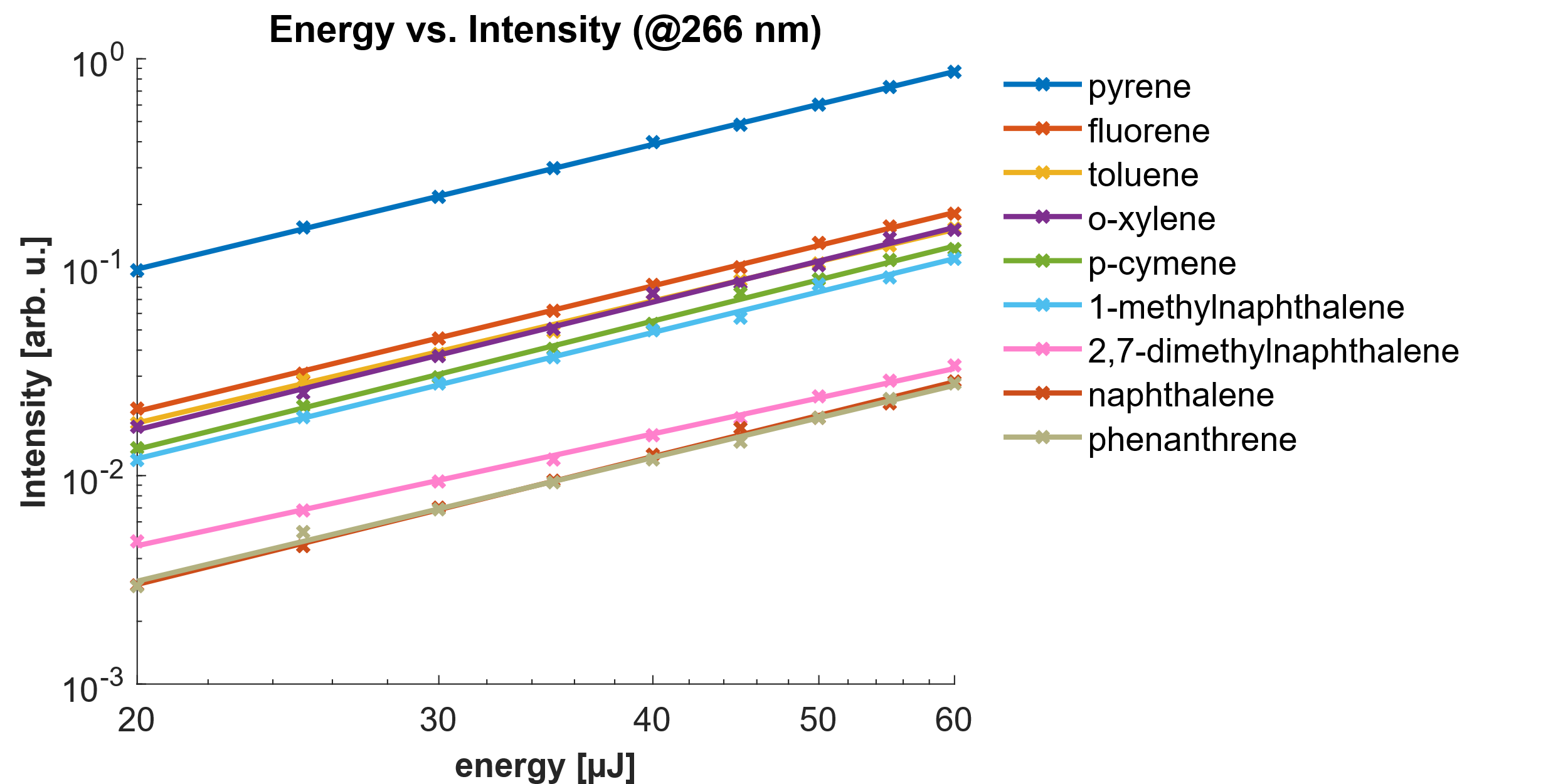


Figure S4 The dependence of the intensity on the laser energy for several compounds in the wavelength range from 20 to 60 µJ at a wavelength of 266 nm for the determination of the exponents for the calculation of the relPICS.

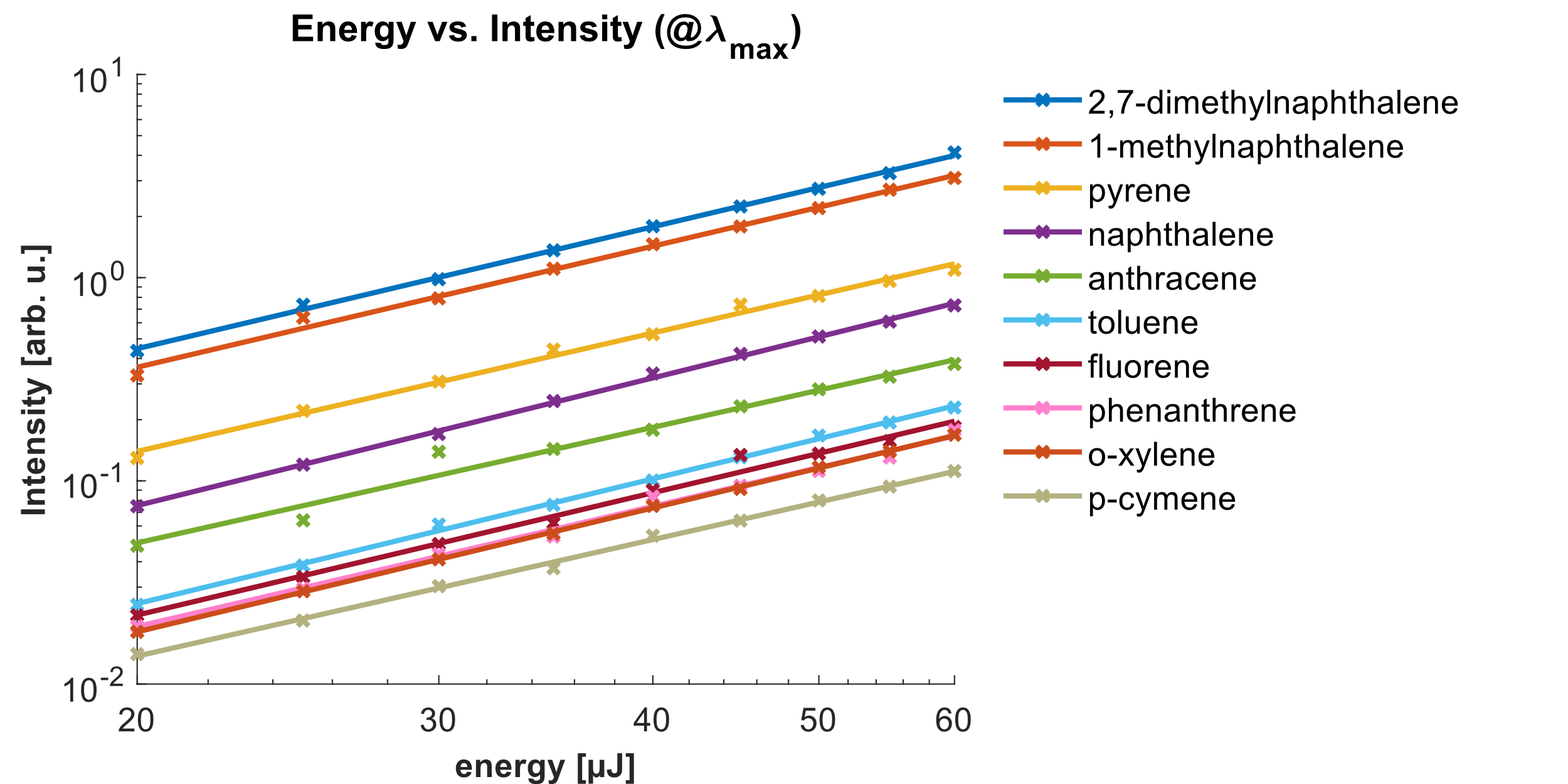


Figure S5 The dependence of the intensity on the laser energy for several compounds in the wavelength range from 20 to 60 µJ at λmax for the determination of the exponents for the calculation of the relPICS.