

# Laser Photochemical Polymerization to Produce Large PAHs

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A photochemical polymerization scheme is described to produce large polycyclic aromatic hydrocarbons containing up to 70 or more carbons. Visible or UV laser irradiation of high-density pressed pellet samples leads to H atom or H<sub>2</sub> diatomic elimination, followed by covalent coupling of PAH monomers to form dimers, trimer and tetramers. Laser desorption mass spectrometry experiments revealed this photochemistry, which has been documented for perylene, pyrene and coronene. In additional experiments, the photolyzed/desorbed material is collected as a film, producing milligram quantities of material. Subsequent LD-TOF-MS analysis of the collected material reveals that it contains monomer and polymer concentrations corresponding to those seen initially in the mass spectrometry. Differential sublimation removes the monomers, purifying the polymers. Spectroscopic characterization of the polymer materials is in progress.

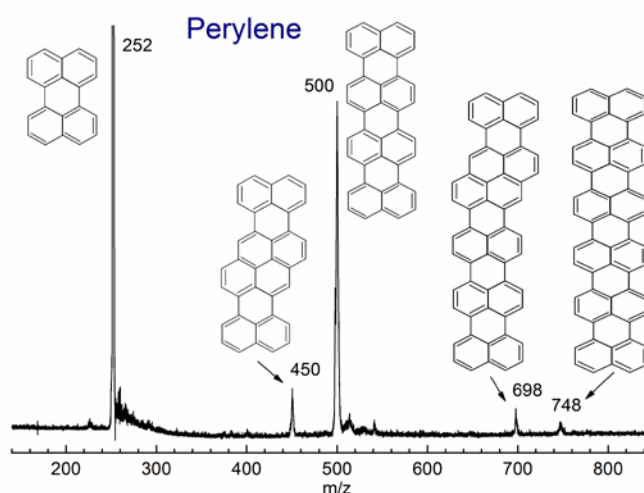


Figure 1: Time-of-flight mass spectrum of perylene polymers produced by UV laser irradiation/desorption of a pressed pellet sample.

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