

The ORGANICS experiments on BIOPAN V: UV and space exposure of aromatic compounds

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We studied the stability of aromatic compounds in low Earth orbit environment and describe the scientific results and successful flight of the ORGANICS experiment on-board the BIOPAN V space exposure facility. This experiment investigated the photo stability of large organic molecules in near Earth orbit. Thin films of selected organic molecules, such as polycyclic aromatic hydrocarbons (PAHs) and the fullerene C₆₀ were subjected to the near Earth orbit environment and the samples were monitored before and after flight. PAHs and fullerenes have been proposed as carriers for a number of astronomical absorption and emission features and are also identified in meteorites. Our experiment on BIOPAN V was exposed to a total fluence of 602.45 kJ m⁻² for photons between 170 and 280 nm. The experiment was also intended as a hardware test-flight for a long-term exposure experiment on the EXPOSE facility on the International Space Station (ISS). For the small fluence that was collected during the BIOPAN V experiment we found little evidence of photo-destruction. The results confirm that PAH molecules are very stable compounds in space.