

REVEALING THE CHEMISTRY OF POLYCYCLIC AROMATIC HYDROCARBONS BY PLASMA SOURCES

DONATELLA LORU, *FS-SMP, Deutsches Elektronen-Synchrotron (DESY), Hamburg, Germany*; DANIEL RAP, *FELIX Laboratory, Radboud University, Nijmegen, The Netherlands*; SÉBASTIEN GRUET, AMANDA STEBER, MELANIE SCHNELL, *FS-SMP, Deutsches Elektronen-Synchrotron (DESY), Hamburg, Germany*.

Detected through the aromatic infrared bands (3-20 μm), polycyclic aromatic hydrocarbons (PAHs) are considered to lock up a large fraction of the carbon in the interstellar medium (ISM) and to significantly impact its physics and chemistry. Despite their importance, much is unknown about their formation and reactivity under the harsh conditions of the ISM.

We are looking at the reactivity of these molecules in the laboratory by means of an electrical discharge nozzle coupled with chirped-pulse Fourier transform microwave (CP-FTMW) spectroscopy in the 2-12 GHz frequency range. Under such energetic conditions, PAHs are expected to undergo fragmentation processes and/or a recombination chemistry. The formed species are then unambiguously identified via their unique microwave signature.

Herein, we present our results obtained from discharge experiments on the PAHs naphthalene (C_{10}H_8) and phenanthrene ($\text{C}_{14}\text{H}_{10}$), both pure and in mixture with acetonitrile (CH_3CN), a simple nitrogen-containing interstellar molecule. An interesting chemistry has been observed for the investigated PAHs, which will be compared and discussed.