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Journal of Physical Chemistry & Biophysics

Editorial

A View on Polycyclic Aromatic Hydrocarbons

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DESCRIPTION

Polycyclic Aromatic Hydrocarbons (PAHs) are widespread around the world, primarily due to long-term sources of anthropogenic pollution. Due to the unique properties of PAHs such as heterocyclic aromatic ring structure, hydrophobicity and thermal stability, PAHs are awkward and highly persistent in the environment. PAH contaminants have been found to be highly toxic, mutagenic, carcinogenic, teratogenic and immune toxic to various forms of life. Therefore, this overview describes the main sources of PAH emissions, exposure routes, and especially the toxic effects on humans. Rapid industrialization and urbanization have led to many anthropogenic activities that release various pollutants into the environment, such as Polycyclic Aromatic Hydrocarbons (PAHs). An integrated PAH remediation method for the efficient reduction of PAH contaminants has also recently been reported. PAHs are composed of two or more fused aromatic rings, a carbon atom and a hydrogen atom. The ring system can exist in several configurations and can be unsubstituted or substituted. PAHs range from semi-volatile molecules to high boiling point molecules. They can occur in the gas phase, the particle phase of the ambient air, or a mixture of both phases. Approximately 500 types of PAHs have been detected in the air, but measurements often focus as a representative of the entire PAH family. Almost 10 years ago, Aitken, Roche and colleagues discovered in a series of ground breaking studies that the MidIR spectrum of active galactic nuclei differs significantly from that of starburst galaxies. Starburst galaxies show remarkable radiation characteristics of 8.7 and 11.3 qm many active galactic nuclei are usually non-functional. Studies of particle heating with X-rays have shown that particles with a radius of N 10A are actually destroyed by hard photon PAHs. Aggregates of N 100 atoms are unlikely to behave like solid systems, so a complete study of PAH disruption should take into account the molecular properties of these particles. The MidIR spectra of the starburst and Seyfert galaxies are significantly different. Starburst galaxies emit prominent PAH features, but Seyfert galaxies usually do not. Even some dusty Seyfert galaxies do not show the characteristics of PAHs, suggesting that PAHs were somehow selectively removed from the internal regions. In active galactic nuclei, this selective extinction can be achieved with much more abundant transmitted X-rays than starbursts. A small PAH with 10 carbon atoms completely decays after absorbing EUV photons and is quickly destroyed by X-rays. Theoretical discussion suggests that carbon-N-shell photoionization can emit carbon-containing fragments from PAHs with sizes of up to 200 carbon atoms, but before X-ray irradiation is tolerated without evaporation. Laboratory experiments are needed to determine how large the PAH should be. PAHs below this threshold repel carbon atoms at near x-shell photoionization rates, and even weak ISM AGNs cannot survive unshielded within 1 kilo/sec. Nevertheless, some PAH is released in 10 percent of the Seyfert galaxy. Emitted PAHs in these galaxies are probably located in the starburst region around the nucleus, which is shielded from the AGN by the large column density of X-ray absorptive gas. Next, the narrow-band 3.3 square meter image of these objects is intended to reveal the direction within the host galaxy where the AGN radiation was blocked, and the supplementary optical forbidden line map escapes the AGN radiation. In addition, PAH mapping distinguishes between starburst and Seyfert activity and should provide insight into possible AGN starburst connections, especially in hybrid galaxies such as the NGC 7469, where both phenomena are energetically important.

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Received: November 15, 2021; **Accepted**: November 29, 2021; **Published**: December 06, 2021

Citation: Monika G (2021) A View on Polycyclic Aromatic Hydrocarbons. J Phys Chem Biophys. 11:e311.