

Analysis of Edge Structures of Polycyclic Aromatic Hydrocarbons using Infrared Emission Bands

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The emission observed from interstellar polycyclic aromatic hydrocarbons (PAHs) is shown to exhibit significant variation along different sightlines, apparently dependent on a number of factors including type of astronomical source under observation and degree of irradiation affecting the emitting material. Of interest are the bands corresponding to carbon-hydrogen vibrations, as these define the edge structures in aromatic molecules, and variations within them can give information on molecular morphology and degree of hydrogenation present. This can also give information on aliphatic material, which may be indicative of dust grain formation and growth processes occurring. This study examines archived spectroscopic data from AKARI and ISO in the 3 μm , 11 μm , and (where available) 5 μm regions to investigate edge structure variation in PAHs. Results are discussed in terms of molecular processing and growth of carbonaceous dust grains.