

THE RADIO SPECTRA OF 1,2,3- and 1,2,4-TRICYANO BENZENE

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Aromatic hydrocarbons and their polycyclic representatives (PAH) are often stated to be the most abundant free organic molecules in space. However, with the now more than 140 astronomically known species no aromatic compound besides the IR-spectroscopically detected benzene itself is confirmed so far. Possibly because PAHs typically have only a small dipole moment - the prerequisite for a radioastronomical detection.

Tricyanobenzenes offer a new approach for the detection of aromatic species: Easily formed by condensation of - in the interstellar medium abundant - cyanoacetylene, they exhibit a considerable dipole moment. With the analysis of the previously unknown microwave spectra - complicated by the quadrupole coupling of the three nitrogen nuclei - the spectroscopic data for an astronomical search are now available. In addition, the analysis of the nuclear quadrupole hyperfine structure allows for some insight into the chemical bonding of the substituted aromatic systems.