

Quartet states of tetracyanoquinodimethane (TCNQ) negative molecular ions

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Abstract

In this paper, anomalously long-lived (ms) negative molecular ions of tetracyanoquinodimethane (TCNQ) were registered by means of the negative ion mass-spectrometry of the resonance electron capture. The ions are formed at several resonance states of the molecule plus electron system as a result of the electron capture by TCNQ molecule in the gas phase, when the electrons attached have nonzero energy. It is shown that the anomalously high life time of the ions is caused by the ions-quartets formation from the ions-doublets via the intersystem crossing. The results obtained can be useful for understanding TCNQ behavior in the devices of single molecule electronics and the negative differential resistance effect which governs, as it is well-known, the work of such devices.