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Oxidized Pentacene Micro-Rods Obtained By Thermal Annealing Of Pentacene**Thin Films In Air**

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Prolonged annealing of pentacene thin films in air leads to the formation of nano- and micro-scale rod-shaped structures at temperatures equal to or higher than 130°C. Scanning electron microscopy measurements indicated their crystalline structure, while UV-vis absorption spectra revealed presence of different species of oxidized pentacene, including 6,13-pentacenequinone. The mechanism of growth of microcrystals from oxidized pentacene molecules is discussed. Raman and UV-vis absorption spectra dependences on film thickness (in 30 – 300 nm range) and on thermal annealing conditions (in air and nitrogen at ambient pressure at 100 and 150°C) were also studied. These spectra are not largely affected by annealing if it is performed in nitrogen at any of studied temperatures and annealing times (few hours to few days). However, if annealing is performed in air, at temperatures 130°C and higher, changes in spectral features are significant due to film oxidation.

Key words: pentacene; organic films; microstructures; optical spectroscopy; thermal annealing; oxidation.

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