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Pentacene Thin Film Growth[1] BRADLEY LOCKHART, Ohio Northern University, JESSICA BICKEL, Cleveland State University — Pentacene is a common organic semiconductor with a relatively high conductivity that increases when crystallized. The pentacene was studied by depositing it on highly ordered pyrolytic graphite (HOPG) using a thermal evaporator and characterizing it with scanning tunneling microscopy (STM). The initial depositions suffered from inconsistent growth rate readings. We determined that the inconsistency was due to the fact that while the thermal evaporator chamber is under high vacuum, the daily pressure varied between 1 and 7x10-5 torr during the evaporation. These variations in pressure had a impact on the growth rate of the pentacene while at the same temperature. We subsequently developed a method to measure the growth rate immediately before the deposition circumventing the issue of the variable pressure. This was done by opening the shutter of the thermal evaporator to a specific angle so that the growth rate could be measured without actually depositing any material on the HOPG. During the study of the STM data, several images showed the deposited pentacene either forming into clumps, or into seemingly more ordered track-like patterns. These images were analyzed to find the dimensions of these structures and compared to previously gathered pentacene data from other groups.

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