Because pentacene has a high carrier mobility, it has been studied extensively for potential applications in molecular electronic devices [1,2]. Since the first monolayers of pentacene play a dominant role in the electronic transport properties of the devices, it is important to study the pentacene films at the initial growth stage.

NEXAFS (Near Edge X-ray Absorption Fine Structure) spectroscopy is used to study monolayers and bulk pentacene films on SiO_2. We find that different growth rates produce different orientation angles at low coverage (1-6 ML). These orientation angles are explained by a mixture of the thin film phase and the bulk phase. Our work shows that NEXAFS is a complementary method to X-ray diffraction [3], which makes it possible to detect structural changes in the initial growth phase.

References: