

ST-P001

### Early Stage of Pentacene Growth on the CYTOP Doped Graphene Surface

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The patterning and doping technique enables graphene to replace the metal electrode as a charge injection layer in the pentacene based thin film transistor. However, it is known that pentacene molecules form lying-down coordination on the graphene surface. Pentacene thin film showed that the highly occupied molecular orbital is 0.2~0.4 eV lower in the standing up coordination than in the lying down coordination. Here, we report the formation of standing-up coordination and lowered HOMO level of the pentacene layer grown on the graphene layer doped with CYTOP.

**Keywords:** pentacene, graphene, CYTOP

ST-P002

### Chemical Doping of TiO<sub>2</sub> with Nitrogen and Fluorine and Its Support Effect on Catalytic Activity of CO Oxidation

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The effect of substrate on catalytic activity of CO oxidation with transition metal Platinum nanoparticles on doped and undoped TiO<sub>2</sub> was investigated. Titanium dioxide was doped chemically with non-metal anions including nitrogen and fluorine. Undoped TiO<sub>2</sub> was synthesized via simple conventional sol-gel route. Thin films of titania were developed by spin coating technique and the characterization techniques SEM, XRD, UV-Vis Absorption Spectroscopy and XPS were carried out to examine the morphology of films, crystal phase, crystallites, optical properties and elemental composition respectively. XPS analysis from doped TiO<sub>2</sub> confirmed that the nitrogen site were interstitial whereas fluorine was doped into TiO<sub>2</sub> lattice substitutionally. Catalytic activity systems of Pt/doped-TiO<sub>2</sub> and Pt/undoped-TiO<sub>2</sub> were fabricated to reveal the strong metal-support interaction effect during catalytic activity of CO oxidation reactions. By arc plasma deposition technique, platinum nanoparticles with mean size of 2.7 nm were deposited on the thin films of doped and undoped titanium dioxide. The CO oxidation was performed with 40 Torr CO and 100 Torr O<sub>2</sub> with 620 Torr He carrier gas. Turn over frequency was observed two to three folds enhancement in case of Pt/doped TiO<sub>2</sub> as compared to Pt/TiO<sub>2</sub>. The electronic excitation and the oxygen vacancies that were formed with the doping process were the plausible reasons for the enhancement of catalytic activity

**Keywords:** Doped TiO<sub>2</sub>, sol-gel, CO Oxidation, Turn Over Frequency(TOF), Strong Metal-Support Interaction(SMSI)