



Contribution ID: 121

Type: Oral Presentation

Optimization of 6,13(bis-triisopropylsilylethynyl)-pentacene (TIPS- pentacene) organic field effect transistor: annealing temperature and solvent effect

DIALLO Abdoul Kadri (1), DIALLO Abdou Karim (2), FALL Sadiara (3), KOBOR Diouma (1), PASQUINELLI Marcel (4), HEISER Thomas (3)

(1) Laboratoire de Chimie et de Physique des Matériaux (LCPM), Ziguinchor, Senegal

(2) University Gaston Berger, Department of Applied Physics, Saint Louis, Senegal

(3) Laboratoire ICube, DESSP, CNRS, Strasbourg, France,

(4) OPTO-PV Group/Institut Matériaux Microélectronique Nanosciences de Provence (IM2NP), Marseille, France

Corresponding author: a.diallo3014@zig.univ.sn

abdou-karim.diallo@ugb.edu.sn

Abstract: In this contribution, we report on the effect of solvents with different boiling points and annealing temperature on the performance of TIPS-pentacene transistors. Several solvents have been used for TIPS-pentacene thin film processing: toluene, chlorobenzene and tetrahydrofuran. To study the influence of solvent and temperature; the electrical parameters of TIPS-pentacene field effect transistor were measured. The highest values of mobilities were $7.1 \times 10^{-3} \text{ cm}^2 \cdot \text{V}^{-1} \cdot \text{s}^{-1}$, $4.5 \times 10^{-3} \text{ cm}^2 \cdot \text{V}^{-1} \cdot \text{s}^{-1}$ and $1.43 \times 10^{-3} \text{ cm}^2 \cdot \text{V}^{-1} \cdot \text{s}^{-1}$ respectively for TIPS-pentacene field effect transistor using chlorobenzene, toluene and tetrahydrofuran and annealed respectively at 120°C, 150°C and 120°C. We have correlated these electrical performances with AFM images in order to point out the role of morphological properties. It is found that the grain size, and roughness highly affect the electrical parameters.

Keywords: TIPS-PENTACENE, TRANSISTOR, SOLVENT, ANNEALING TEMPERATURE

Presenter: DIALLO, Abdoul Kadri (Université Assane Seck de Ziguinchor, Sénégal)

Session Classification: Material Physics