

Materials Science Department – CENIMAT | I3N

Development of RT Printed Electrochemically-Gated TFT Using Metal Oxide NPs as Channel Layer

CENIMAT | I3N / Microelectronic and Optoelectronics Group



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Objectives

- **Synthesis of metal oxide semiconducting nanoparticles by different techniques**
- **Design electrochemical gated field effect transistors**

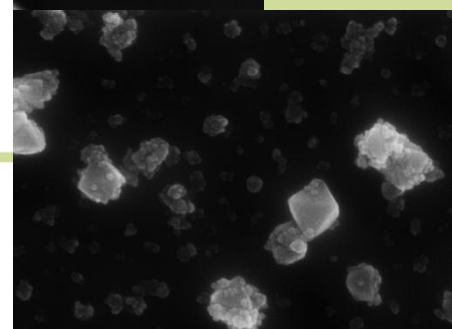
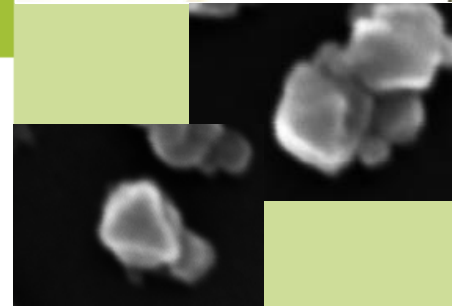
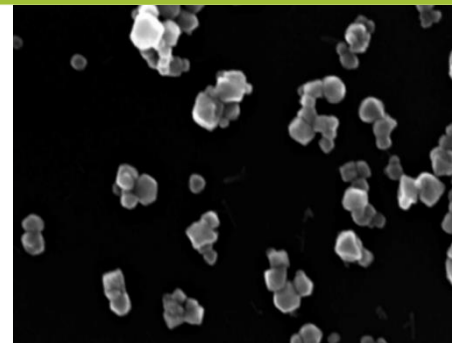
Methodology

Hydrothermal reaction is common method to synthesize different types of nanoparticles, for instance Zn_2SnO_4 (Zinc Stannate). By changing the reaction conditions as like, temperature, concentration of reactants and duration time it is possible to modify sizes and morphology of those nanoparticles.

Additionally, reactions under microwave radiation are developing because of excellent control of reaction parameters, low-cost synthesis route, less time consuming

Expected Results

- ✓ Synthesized znc stannate NPs with sizes from 5 to 20 nm with different shapes
- ✓ Develop nanoink based on above NPs
- ✓ Design TFT with NPs as a channel layer in combination with a three-dimensional electrochemical gating by printing a solid polymer electrolyte over an in-plane structure



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