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*September 2025*

**Project No: 1.1.1.3/1/24/A/070 Interim Results.**

# HYBRID ORGANIC-INORGANIC NANOCOMPOSITES AND NANOSTRUCTURED MATERIALS FOR FLEXIBLE X-RAY DETECTORS (2025-2028)



During the first three months of the project implementation, the following work was carried out:

1. Literature on the principles of X-ray detector operation was reviewed, along with publications and patents on existing devices. Information was gathered on materials and substances used in similar systems.
2. Meetings and ongoing communication between project participants were established. The collected information was discussed, and brainstorming sessions were held to explore potential research directions. Several promising ways were identified.
3. Several trial syntheses were performed for candidate monomer compounds potentially suitable for p-type polymer semiconductors. The corresponding scientific literature was studied, and initial steps were taken toward developing synthesis methodologies, as well as preliminary analytical and purification strategies.
4. A list of missing reagents for synthesis was compiled, and the necessary chemicals and labware were ordered.
5. **Electron microscopy (SEM and TEM)** studies were performed. SEM characterization of $SnS_2$ nanoplates in liquid and TEM analysis of $WSe_2$ nanowires were carried out to verify synthesis quality and provide a baseline for further material development.
6. Adhesion tests were conducted between PET layers and acrylate polymer films, which may serve as flexible substrates for the detectors.

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1. A series of intermediates was synthesized, which will subsequently be used for the synthesis of ligands and the coordination polymers themselves.
2. Several Ni-DABDT coordination polymer samples with different structures were synthesized.
3. The structure of the synthesized compounds was investigated using NMR and XRD methods.

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