Objective

Flexible electronic devices (FEDs) will have a major impact in our daily life if we succeed to encapsulate them into transparent, ultra-high barrier, flexible materials, providing protection against oxygen and vapor, long-term stability and endurance. The realization of such materials, compatible with roll-to-roll (r2r) production processes will allow cost effective large scale FEDs production. FLEXONICS goals are to develop: 1) materials systems consisting of alternating inorganic/organic layers few nm thick to improve the current barrier properties of flexible films by at least a factor of 1000, 2) the relative r2r processes, which will be used for the production of such materials, 3) optical real-time techniques for process control and optimization, with final and specific goal the effective encapsulation of flexible OPV and OLED devices. The above objectives conform to the NMP activity on "Materials processing by radically innovative technologies". The project will extend our knowledge on hybrid organic/inorganic systems, their interfaces and their optical and barrier properties. New techniques will be developed to measure and model the ultra-low gas
permeation. Finally, the optical properties of the hybrid organic/inorganic layers and the light interaction with complex-structured materials will be studied at the fundamental level. The duration of FLEXONICS is 36 months; the project involves 5 leading industries (vacuum equipment and optical instrumentation providers, polymer film producers and converters, producers of electronic devices) and 3 research organizations. The deliverables of the project include: 1) ultra-high barrier organic/inorganic materials, 2) production process for such materials, 3) modeling of permeation mechanisms, 4) new techniques for permeability measurements, 5) modeling of the light interactions with complex structures, 6) new optical instrumentation for process control, and 7) demonstration of operational FEDs properly encapsulated.

Programme(s)

Topic(s)

Call for proposal

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Funding Scheme

STREP - Specific Targeted Research Project

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