

PHOSFOS Fact Sheet – Polymer skins

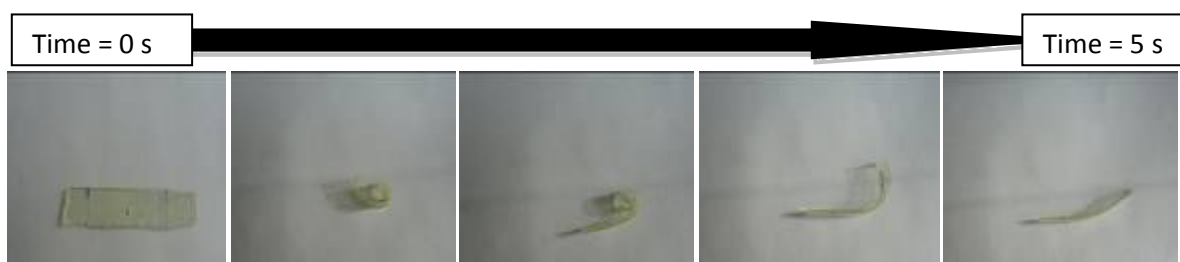
Introduction

Since its start in 2008, PHOSFOS has created a new paradigm for flexible optical sensors integrated with electronic modules and control circuitry. It aimed at developing a generic technology that offers an integrated solution to this increasingly important problem. The project is now reaching its end and has achieved several major breakthroughs in the field of optical sensing, flexible materials, embedding technologies and integration concepts which may be used in a wide range of applications.

Breakthrough

The use of flexible polymer materials in the field of electronics is gaining momentum particularly in biomedical and sensor monitoring applications. We have developed a series of polymer materials that have inherent flexibility and tuneable mechanical strength, that are visually transparent and that have shown to be compatible with commercially available formulations. We have also taken a great step forward in developing novel monomers and prepolymers that supplement commercial formulations and we created novel formulations. Finally, we also developed a new optical fibre coating material that quickly cures on silica fibres under UV irradiation.

Technology



Flexible skinlike materials are based on vinyl polymers with inherent flexibility and curing time of 20 minutes under a low power UV lamp. The flexibility was controlled by adjusting the mole ratios of feed monomers. Novel urethane-acrylate prepolymers were synthesised with controllable molecular weights. These were found to possess thermo-responsive properties under certain conditions (figure above, increasing temperature from left to right). In addition the crosslinked prepolymers were found to shrink with 30% from their original length when exposed to a temperature flux and tensile conditioning.

Application

Polymers developed in the framework of the PHOSFOS project are used in UV curable biocompatible flexible skinlike systems and fibre coatings with tunable properties (flexibility, ...)

Contacts

Scientific: Prof. Dr. Peter Dubruel, University of Gent, PBM group, 281 Krijgslaan, B-9000 Gent,
e-mail: peter.dubruel@ugent.be