

Abstract of stage III

Researches performed in the III-rd stage of the project targeted the enhancement of the compatibility of the polymer films on the gold surface but also the film deposition on the optical fibres support which will be used in the development of the SPR sensor. For films obtaining it was applied the sol-gel method, which could provide transparent films with low thickness.

During this stage there were achieved film depositions on various supports targeting the obtaining of the SPR sensor. All 3 template molecules were used: Ephedrine, LSD and Metamphetamine. In order to improve the compatibility of films to the supports it was used a supplementary silane compatibility agent in the recipes presented in the previous stage report. To this aim film depositions were performed on three supports; Glass surface, Gold surface and the support of optical fibres covered with gold dedicated for SPR sensor. In distinct chapters there are presented preparation and characterization methods for imprinted and non imprinted films.

The procedure for film obtaining was optimized by adding a supplementary silane in precursor solutions, fact which lead to the increasing of the compatibility between films and gold surface.

It was demonstrated the utility and functionality of the technology for spraying deposition of films on various supports: glass, gold, optical fibre. For the demonstration of the utility of MIP film as sensitive layer for SPR sensor, optical properties: refractive index and transmittance were assessed. These results were further used by the coordinator of the project (from Russia) in the tests for demonstration of sensor functionality.

After the deposition the films were analysed by various characterization techniques. The FTIR analysis does not offer too much information, but it was possible to note the presence of peaks corresponding to the monomer and to the used template: Ephedrine, LSD. Methamphetamine.

Demonstration researches performed at the Institute for Automation and Control of the Far Orient filial of the Russia Academy of science (IAC Vladivostok) proved that the sensitive

films obtained by sol-gel method on the optical fibres covered with gold, show a very good adhesion and stability.

The feasibility study show that the technologies elaborated in the project can be transposed at commercial scale. Pilot researches are needed.

During the project running, 2 patent applications were made. 3 ISI articles were published or accepted (instead of 2 promised in the offer). 13 scientific communications were presented instead of 4. A book chapter in international publishing house was published. A poster was presented at a technical exhibition, a workshop was organized. A co-supervision thesis is under development with the University of Toulon on the project topic.