



národní  
úložiště  
šedé  
literatury

**Biomaterial for Optical Sensing of Glucose Based on Organic-Inorganic Polymer.**

Maixnerová, Lucie  
2015

Dostupný z <http://www.nusl.cz/ntk/nusl-201432>

Dílo je chráněno podle autorského zákona č. 121/2000 Sb.

Tento dokument byl stažen z Národního úložiště šedé literatury (NUŠL).

Datum stažení: 11.04.2024

Další dokumenty můžete najít prostřednictvím vyhledávacího rozhraní [nusl.cz](http://nusl.cz).



## 59 Biomaterial for optical sensing of glucose based on organic-inorganic polymer

Lucie Maixnerová<sup>1\*</sup>, Gabriela Kuncová<sup>1</sup>, Martin Koštejn<sup>1</sup>

<sup>1</sup> *Institute of Chemical Process Fundamentals of the CAS, v. v. i., Prague, Czech Republic*

\**maixnerova@icpf.cas.cz*

Organic-inorganic polymerOrmocer® is a hybrid polymer material synthesized by the sol-gel process, which is cured by UV radiation. In addition to curing at low temperatures chemical and thermal stability, final properties of Ormocer® as toughness and gas permeability might be modified in broad ranges. Currently Ormocer®'s are used in dental medicine and ophthalmology. We tested this polymer as an encapsulation carrier of biorecognition layer of optical biosensor of glucose.

The biorecognition layer, the biomaterial, contained enzyme glucose oxidase prepolymerized on Sepabeads® and ruthenium complex, which were both incorporated in Ormocer®. We studied the influence of an amount of Ormocer® KSK 1238 on analytical features of the biosensor as sensitivity (SE), limit of detection (LD), limit of quantification (LQ), linear dynamic range (LDR) and long-term stability.

We found that biorecognition layers containing less than 50 % of Ormocer® were mechanically unstable. The layers that included 65 % of Ormocer® performed higher sensitivity (10 %) and lower LD, LQ, and LDR (15%) in comparison with those comprising 80% of Ormocer®.

The analytical features of the biosensors were stable with the relative standard deviation 10 %, during one year.

Chemical inertness and ruggedness of the biomaterial of the biorecognition layer make possible to use this sensor in industrial bioreactors as well as in human medicine.