XXXI International Conference on
Surface Modification Technologies (SMT31)

JULY 5-7, 2016, MONS, BELGIUM

DESIGN OF SOL-GEL MESOPOROUS COATINGS FOR ANTI-FINGERPRINT APPLICATIONS ON GLASS

Marie-Eve Druart[a], Isaline Recloux[a], Sophie Billet [b], Adeline Derouaux[c], Cécile Van De Weerdt[c], Marie-Georges Olivier[a,*]

[a]*University of Mons (UMONS), Materials Science Department, Place du Parc 20, 7000 Mons, Belgium*
[b]*AGC Glas Europe- AGC Technovation Center, Rue Louis Blériot, 12, 6041 Gosselies, Belgium*
[c]*Université de Liège (ULg), Giga –research, Molecular Biomimetic and Protein Engineering Laboratory, Quartier hôpital, 11, Avenue de l'hôpital, 4000 Liège, Belgium*

Abstract

Nowadays, the use of mesoporous sol-gel films as smart coatings is growing. Their porosity is used to embed active species in applications such as drug delivery, catalysis, sensors, active corrosion protection, … The film mesoporosity is produced by evaporation induced self-assembly (EISA) process. This process is based on the addition of a templating agent in sol-gel formulation. The thermal removal of surfactant agent allows to control the coating mesostructure. In this work, the mesostructure of the sol-gel layer is designed to be used as reservoir for active biomolecules. In order to assure a good incorporation and storage of biomolecules, the size of mesopores and their configuration were tuned as a function of application and synthesis parameters. The effects of the sol-gel composition and deposition process on the sol-gel mesostructure were evaluated. Scanning electron microscopy (SEM) and water adsorption/desorption isotherms recorded with a quartz crystal microbalance (QCM) were used to characterize the morphologies of the sol-gel film. Rheological measurements were carried out to check the stability of the sol-gel solution. The anti-fingerprint performance due to the combination of mesoporous film and enzymatic solutions were assessed by using an artificial sebum.

Keywords: mesoporous, anti-fingerprint, evaporation induced self-assembly

---

* Corresponding author. Tel.:+003265374488; fax: +003265374416.
E-mail address: marie-eve.druart@umons.ac.be