

EULANETGERMAT – IRELAC SEMINAR BRUSSELS

Structure of Silver-Containing Sol-Gel Hybrid Materials and its Performance as Biocide Coatings

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Since beginnings of 2008, Dr. Sergio Pellice is a researcher of the argentine National Council of Scientific and Technical Researches (CONICET) specialized in development and applications of organic-inorganic hybrid materials based on the sol-gel method. In this field, he has published 19 articles in specialized journals and several works in international conferences.

SEMINAR PRESENTATION

DESCRIPTION OF THE OBJECTIVES

Development of thin biocide coatings brings the possibility to functionalize surfaces exposed to biologic contamination in order to inhibit the spreading of contagious infections. In this work, hybrid organic-inorganic sol-gel materials were functionalized with silver ions in order to analyze the relationship between the hybrid structures, silver ion stability and biocide effect.

DESCRIPTION OF THE MAIN RELEVANT RESULTS

Hybrid silica-methyl and silica-epoxy coatings were synthesized, through the sol-gel method, by hydrolytic condensation of organically-functionalized alkoxy silanes under acidic conditions. Silver ions were added in the sol stage by a silver nitrate solution.

Homogeneous and cracks-free coatings were obtained through dip-coating. Hybrid structures and thermal evolution of silver nanoparticles were analyzed by Small Angle X-ray Scattering (SAXS) through synchrotron radiation. A spinodal-like phase separation was resolved in each one of the hybrid matrixes. Although the biocide effect was verified against *Escherichia coli*, through the inhibition halo in agar diffusion tests, diffusion analysis suggest that a matrix modification, with incorporation of denser ceramic nanoparticles, could increase use life of biocide coatings.

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PART B

PROPOSAL ACRONYM.EULA-NETCERMAT