

“Inorganic films and silver nanoparticles with antibacterial properties”

Dr. M. Ignacio Azocar G.

Facultad de Química y Biología, Universidad de Santiago de Chile

In recent years, organic-inorganic hybrid materials, such as polymer-oxide films, have attracted considerable attention due to their improved physical, mechanical and thermal properties, compared with the pure polymeric material or inorganic oxide material. Further, sol-gel chemistry allows one to combine, at the nanosize level, inorganic and organic in a hybrid composite. Thus, depending on the type of the nano-modifier used in the preparation of a nanocomposite, in addition to the molecular inorganic-organic network, the material is also tailored by the physical, electronic, optical, antimicrobial and catalytic properties of the nano-modifier. In particular, the developing of new antimicrobial materials would benefit greatly many applications, including biomedicine, food production, storage and metal protection. This motivated by disease outbreaks caused by different pathogenic bacteria, together with the increase of bacterial resistance to antibiotics.

The present investigation aims to study the antibacterial properties of a hybrid sol-gel films, zirconia-polyether glycol, and Silanols modified with silver nanoparticles, which have been recently reported as a potential coating for corrosion protection of stainless steel. The incorporation of silver nanoparticles is expected to add bactericidal properties to this inorganic-organic hybrid film for their use in protecting medical apparatus.

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