

Functionality Opportunities for Hybrid Sol-Gel Coatings

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Abstract

Research and development of "Hybrid organic-inorganic" nanocomposites, which are made of organic and inorganic components combined over length scales ranging from a few Angstroms to a few tens of nanometres has grown considerably since the early 1980's, The development of hybrid organic-inorganic materials is mainly due to the development of soft inorganic chemistry processes, especially sol-gel processes, where mild synthetic conditions allow versatile access to chemically designed combinations of inorganic domains obtained via inorganic polymerization reactions with fragile entities such as organic or even bioactive molecules. By far the most extensively studied of these materials is that of SiO₂-based sol-gel nanocomposites.

The group at Sheffield Hallam have exploited the benefits of combining organic and inorganic components to produce coating systems that have a variety of properties and functionalities.

The presentation will demonstrate the potential functionality of sol-gel hybrid coatings for the following applications;

1. Biosensors
2. Self-healing anti-corrosion coatings
3. Anti-fouling coatings.