Organic-Inorganic Hybrid Sol-Gel Coatings for Corrosion Mitigation in Reinforced Concrete Structures

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Corrosion protection of metals using coatings is an important and an active research area in materials science and in industry. Organic-inorganic hybrid (OIH) sol-gel coatings exhibit a high potential for corrosion protection. It is expected in the future that these coatings, not only act as a replacement for chromate based pre-treatments but also integrate multifunctional systems with pre-emptive behaviour such as self-healing.

The corrosion behaviour of such coatings may be characterized by several electrochemical techniques. Nevertheless, this workshop is focused on the use of electrochemical impedance spectroscopy (EIS), polarization resistance ($R_p$) and galvanic current ($i_{gal}$). Some recent experiences on the use of these techniques on galvanized steel coated with different OIH materials in alkaline environments will be presented and its strengths and limits will be discussed.