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## **ACTIVE PROTECTIVE MULTI-FUNCTIONAL COATINGS BASED ON "SMART" NANOCONTAINERS**

The destructive effect of environment and the corrosion induced degradation are the important problems which determine the service life of many metallic components. The application of organic coatings is the most common and cost effective method of improving protection and durability of metallic structures. However the degradation processes develop faster after disruption of the protective barrier. Therefore an active protection based on “self-healing” of defects in coatings is necessary to provide long-term effect.

The present paper overviews our recent progress in development of novel protective coatings with self-healing ability on the basis of nanocontainers that release entrapped corrosion inhibitor in response to presence of corrosive species. The new nanocontainers for organic and inorganic corrosion inhibitors were developed in this work employing nanocarriers including polyelectrolyte layer by layer assembled structures, mesoporous nanoparticles, halloysite nanotubes and different nanoclays. The combination of different nanocontainers in the same coating system was demonstrated to provide an important cooperative effect especially when active coatings for hybrid assemblies are considered.

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## **NEW SCIENTIFIC AND NANOTECHNOLOGICAL OPPORTUNITIES OF NANOMATERIALS IN THE FIELD OF ELECTROCHEMISTRY**

The design of new material architectures have emerged as an interesting aspect of nanotechnology for fabricating advanced functional materials. Recently, many progresses are devoted to develop innovative strate-