Special Issue

Advances in Plasma Electrolytic Oxidation (PEO) Coatings

Message from the Guest Editor

Due to climate change, the exhaustion of fossil fuels, and the shortage of raw materials, research efforts must be focused towards finding and developing highly efficient industrial processes and green technologies. At the same time, new solutions promoting human health must be found, such as by improving drug delivery or the biocompatibility and durability of medical prostheses. For all these purposes, plasma electrolytic oxidation (PEO) appears as a credible alternative to conventionally used anodizing; it is time efficient, it can be controlled, and it is conducted in electrolyte free of hazardous compounds. Thick crystalline oxide layers can be grown by PEO processing on various metals and their alloys (Al, Mg, Ti, etc.), enabling the substantial improvement of their mechanical properties and corrosion resistance. Depending on the nature of the substrate and composition of the electrolyte, PEO coatings can exhibit catalytic, biomedical and corrosion-protective properties, among others. This Special Issue aims to address recent advances in PEO processing, understanding and modeling of the process, and possible applications of PEO-treated surfaces.

Guest Editor

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Message from the Editorial Board

Metallic materials play a vital role in the economic life of modern societies; contributions are sought on fresh developments that enhance our understanding of the fundamental aspects related to the relationships between processing, properties and microstructure – disciplines in the metallurgical field ranging from processing, mechanical behavior, phase transitions and microstructural evolution, nanostructures, as well as unique metallic properties – inspire general and scholarly interest among the scientific community.

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