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Non-ferrous alloys modification by nano compound

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In recent years, metals strengthening became the main challenge in modern materials industry, especially non-ferrous alloys. The majority of works describe non-ferrous alloys strengthening and physical properties improvement by the means of alloying process, heat treatment and mechanically affecting applying ultrasound or vibration during solidification process. Current work presents a novel approach of nano compounds (ceramic nanopowders, carbon nanotubes and inorganic nanotubes) influence on non-ferrous alloys such as aluminum and copper. It was found that addition up to 0.1 wt.% of nano compounds cause to the mechanical properties improvement in aluminum and copper alloys. Microstructural, chemical and phase composition changes and their influence to the obtained mechanical properties will be presented and discussed in the work. The obtained results after ceramic nanomaterials modification showed significant improvement in elongation while the strength remained unchanged. While the alloy was modified by inorganic nanotubes strength and elongation were improved simultaneously. The obtained promising results would lead metallurgy industry to fabricate economically beneficial metals for advanced applications for automotive and aerospace industry.

Biography

Konstantin Borodianskiy is the Head of Metallurgy and Applied Nanoscience Research Lab and an Assistant Professor at the Department of Chemical Engineering, Biotechnology and Materials in Ariel University, Israel which he established after his Postdoctoral studies at University of Windsor, Ontario, Canada. His research focuses on metallurgy of non-ferrous alloys, mechanochemistry, synthesis of intermetallic materials and X-ray diffraction investigations. He has more than 10 manuscripts, 2 chapters in books and was involved in 4 different cooperation research projects with automotive and aerospace industries. He is also a Founder of the XRD Unit at the Ariel University.

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