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Microstructure, mechanical properties and machinability of electrically conductive SiC based composites

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A range of complex composites based on SiC matrix with conductive additives such as TiNbC and carbon nanotubes of various volume fractions was prepared. The microstructure and chemical composition were studied by SEM equipped with EDX analyzer. Mechanical properties such as hardness and fracture toughness of prepared composite materials were evaluated by means of Vickers indentation. Propagation of indentation cracks was analyzed using light microscopy and SEM. Nanohardness and elasticity of individual constituent phases were determined by instrumented nanoindentation. Wear and its mechanisms were studied by means of tribological testing in pin-on-disc configuration and wear resistance. Additionally, the electric conductivity as function of volume fraction and distribution of the condutive additives was determined and percolation limits established. Machinability of the prepared materials by electric discharge technique was tested and material removal mechanisms determined.

Biography

Pavol Hvizdoš has completed his PhD in Material Sciences from Technical University, Košice, Slovakia. He has been working at the Institute of Materials Research since 1988 and as Director since 2014. He spent as Marie Curie Fellow for two years at Queen Mary University, London, UK. Later, he worked for five years as Ramon y Cajal Fellow at Polytechnic University of Catalonia, Barcelona, Spain. He has published more than 100 papers in reputed journals with more than 370 citations.

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