

ELECTRICAL CONDUCTIVITY AND MICROSTRUCTURAL ANALYSIS OF COMPOSITE Cu-Ag-Cr-Al₂O₃ AFTER SINTERING ON POWDER METALLURGY PROCESSING

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The aim of this work was to produce copper-chromium-silver alloys with alumina by powder metallurgy, forming a composite, keeping good mechanical (hardness test) and good electrical (electrical conductivity) properties. The elements are added to copper alloys with purpose to improve mechanical strength, ductility and thermal stability, without causing considerable damage in its shape, electrical and thermal conductivity. The metallic powders with alumina have been mixed for an appropriate time, compressed in uniaxial pressure and sintered at temperatures of 923K to 1073K in appropriate vacuum. The obtained alloys were characterized by electrical conductivity, optical microscopy, and Vickers hardness measurements. The steps performed in composites obtained by powder metallurgy processing indicate adequate mechanical resistance values (450 MPa) and, electrical conductivity in the range $0,216 \leq \sigma \leq 0,309$ ($\mu\Omega\text{cm}$)⁻¹ (35 to 45% IACS). Electrical conductivity measurements and analysis of microstructures by optical microscopy suggest that these composites are relevant to the application as electrical contact material used in consumer electronics devices.