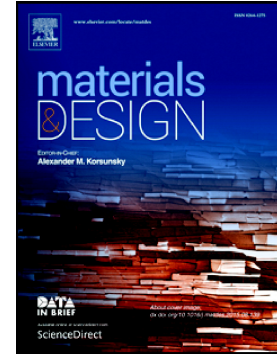


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Novel processing of Ag-WC electrical contact materials using spark plasma sintering

Nachiketa Ray^{a,*}, Bernd Kempf^b, Gunther Wiehl^b, Timo Mützel^b, Frank Heringhaus^b,
Ludo Froyen^a, Kim Vanmeensel^a and Jef Vleugels^a

^a KU Leuven, Department of Materials Engineering, Kasteelpark Arenberg, 44, 3001 Heverlee, Belgium

^b Umicore AG & Co. KG, Rodenbacher Chaussee 4, 63457 Hanau-Wolfgang, Germany

Abstract

Ag-WC (60-40 wt.%) contact materials based on three WC particle size powders were doped with 0.1 wt.% Ni and processed by an appropriate powder pre-treatment followed by spark plasma sintering (SPS). The contacts produced were already bonded to a copper profile during SPS in order to eliminate additional processing steps. The SPS composites had a more homogeneous microstructure and were tougher and softer than the materials produced by conventional press-sinter-infiltration. The infiltrated contacts had a lower arc-erosion whereas the contacts produced by both processes had a similar contact resistance. The microstructure after switching confirmed that the SPS materials had a porous contact surface layer and were crack-free in contrast to their press-sinter-infiltrated equivalents.

Keywords: Metal matrix composites; Powder metallurgy; Spark Plasma Sintering; In-situ joining; Flexural strength; Electron backscattered diffraction

*Corresponding author

Telephone number: +32 16 37 36 09

E-mail address: nachiketa.ray@kuleuven.be; nachiketa.ray.1014@gmail.com

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