

TOUGHNESS AND DIELECTRIC BEHAVIOR OF POLYCRISTALLINE ALUMINA.

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Abstract- Different alumina materials were elaborated in order to vary micro structural parameters (grains size, densification, porosity, intergranular phase). These ceramic materials were then characterized from the mechanical point of view (hardness, toughness, friction and wear) and dielectric breakdown. The comparison of these various results shows that for all these properties, the grain size and, thus also, nature of the secondary phases are the most discriminating microstructural parameters.
Moreover from the tribological point of view, the dielectric characteristic of materials (breakdown strength) has a fundamental role on the creation of the third body and the properties of this last: a finely agglomerated third body will be obtained for high breakdown strength. Such third will be able to protect the substrate and thus to reduce later wear. In same logic a correspondence between breakdown strength and toughness was established, thus confirming the mechanics-electric correlation existing for the non-conductive materials.

Key words- Al_2O_3, Breakdown, Toughness and toughening, Wear resistance.

Biography

Haddour Lillia, Doctor in metallurgy obtained at the Algiers National Polytechnic School in Algeria on 2009. She has worked on the relationships between the microstructure and mechanical and dielectric properties of polycrystalline alumina. This work was done in collaboration with the IFOS Lyon Central School and the Saint Etienne National Mining School. Currently, she is a research professor in the Materials Technology Laboratory at the University of Science and Technology HB in Algiers. She is leading a research project on thermal projection and tribology of metals and composites and published two articles.

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