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STUDY OF THE RESISTANCE TO CRACK PROPAGATION IN NANO FINE GRAINED ALUMINA BY ACOUSTIC EMISSION

The ceramic brittleness is due to pre-existent micro-cracks that become unstable under the effect of a stress and leads to the fracture of the specimen. However, alumina presents a crack growth resistance that translates stable crack propagation before the fracture. In this case, the material toughness is not constant but increases with the crack extension. It depends on the crack extension da from an initial crack size a . The curve representing the crack growth resistance variation R , or the stress intensity factor KR , according to da is called R-curve or KR-curve. The bridging by grains and the crack ramification are responsible for the crack propagation resistance. The interest of the acoustic emission is to obtain data on emissive events and to correlate them to mechanisms responsible for their generation using the rate of numbering N/dt : number of arks by unit of time.

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