

MICROWAVE ASSISTED REACTIVE SINTERING OF ZIRCONIUM OXYNITRIDES

M. Panneerselvam* and M. Willert-Porada

Chair of Materials Processing, University of Bayreuth, Germany.

Microwave assisted reactive sintering of ZrO_2 -AlN and ZrO_2 -ZrN mixtures have been performed under nitrogen and argon atmospheres. Mixtures containing nitrides up to 30 mol% have been sintered at 1600° C for 3 hours. Conventional sintering, under identical conditions, has also been performed for comparison. It has been found that microwave sintering results in a microstructure, which is considerably different from that of conventionally sintered samples. Microwave sintering results in a higher fraction of zirconium oxynitrides in comparison to conventional sintering. In addition, AlN seem to enhance the reaction kinetics compared to ZrN. Reactive sintered samples have been characterized by XRD, FEM, TEM and NMR. Results will be presented and discussed in view of the role of microwaves, atmosphere and AlN in enhanced reaction kinetics.