

MICROWAVE INDUCED COMBUSTION
SYNTHESIS OF CERAMIC AND CERAMIC-
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We have used microwaves to induce self-propagating high temperature synthesis (SHS) in the reaction $3\text{TiO}_2 + 3\text{C} + (4+x)\text{Al} \rightarrow 3\text{TiC} + 2\text{Al}_2\text{O}_3 + x\text{Al}$. The SHS process was studied for $x = 0$ and 4 , with and without the application of uniaxial pressure. A TE102 microwave cavity mode internally ignited the samples using less than 50 watts. The resultant microstructure of the microwave processed samples were compared to SHS products obtained using a conventional hot wire ignition technique. Uniaxial stresses along the vertical axis of ≈ 1400 and 200 psi were applied simultaneously as the SHS reactions were initiated in some of the conventional and microwave processed samples, respectively. SEM photomicrographs will be presented that show the different microstructural features of the products using the microwave and hot wire techniques. [Work supported by NASA]