

# The Effect of Microwave Energy on Sintering

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Dissertation submitted to the Faculty of the  
Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the  
degree of

Doctor of Philosophy

In

Materials Science and Engineering

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April 1<sup>st</sup>, 2011

Blacksburg, Virginia

Keywords: Microwaves, Sintering, Activation Energy, Zirconia

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J. J. Moore, in: 2007 ANS/ENS International Meeting and Nuclear Technology Expo, Washington D.C; used with permission from Dr. Moore, letter attached.

**Figure 2.6** [fair use]

R. M. German, Sintering Theory and Practice, John Wiley, New York, 1996. Fair use determination attached.

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M. Janney, H. Kimrey, in: Spring meeting of the Materials Research Society, San Francisco, CA, 1990. Works by the U.S government are not eligible for U.S copyright protection. OSTI ID: 5193919.

**Figure 2.10** [fair use]

J. Wang, R. Raj, Journal of the American Ceramic Society 73 (1990) 1172. Fair use determination attached.

**Figure 2.15** [fair use]

D. E. Clark, W. H. Sutton, Annual Review of Materials Science 26 (1996) 299. Fair use determination attached.

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M. A. Janney, C. L. Calhoun, H. D. Kimrey, Journal of the American Ceramic Society 75

(1992) 341. Fair use determination attached. Fair use determination attached.

**Figure 2.17** [fair use]

A. De, Ultra rapid Sintering of Alumina with Microwave Energy at 2.45 GHz, Ph.D. thesis, University of Florida, 1990. Fair use determination attached.

**Figure 2.18** [fair use]

R. Wroe, A. T. Rowley, Journal of Material Science 31 (1996) 2019. Fair use determination attached.

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I. Ahmad, Effect of Microwave Heating on the Solid State Reactions and Mass Transport in Ceramics, Ph.D. thesis, University of Florida, 1991. Fair use determination attached.

**Figure 2.20** [fair use]

Z. Fathi, Surface Modification of Sodium-aluminosilicate Glasses using Microwave energy, Ph.D. thesis, University of Florida, 1994. Fair use determination attached.

**Figure 2.21** [fair use]

A. G. Whittaker, Chemistry of Materials 17 (2005) 3426. Doi: 10.1021/cm050351i. Fair use determination attached.

**Figure 2.22** [fair use]

M. Janney, H. Kimrey, W. Allen, J. Kiggans, Journal of Materials Science 32 (1997) 1347. Fair use determination attached.

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**From:** "John Moore" <jjmoore@mines.edu>  
**Date:** Thu, 6 Mar 2008 07:52:58 -0700  
**To:** "Raghu" <r4thrida@gmail.com>, <Jon.Carmack@inl.gov>  
**CC:** "Diane Folz" <dfolz@mse.vt.edu>

Raghu,

I have attached the pdf version of the slides I presented at the Washington review meeting that coincided with the ANS meeting in DC.

Please let me know if you need any additional information.

Kind Regards,

John Moore

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**From:** Raghu [mailto:r4thrida@gmail.com]  
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**To:** Jon.Carmack@inl.gov  
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Hello Mr. Carmack,

We have just received the CD on the talks that were presented for *U.S. Department of Energy Fuel Research Initiative Overviews-Panel* session held at "2007 ANS/ENS International Meeting and Nuclear Technology Expo" on 15th Nov 2007.

The presentation that we are interested in

"*The Application of Self-Propagating-High-Temperature Synthesis (SHS) to the Fabrication of Actinide Bearing Nitride and Other Ceramic Nuclear Fuels*" by Dr. John J. Moore (Colorado School of Mines)

is not their in your CD. It does have the SHS reaction videos files but does not have the presentation.

Is there any way we could get a copy of this presentation ?

I am also copying this email to Dr. Moore in case he is interested in sending us the presentation directly.

Signing off in positive anticipation

Raghu

<b>2007_11-12 Final Application of Self-Propagating High Temperature Synthesis (SHS).pdf</b>	<b>Content-Type:</b> application/pdf <b>Content-Encoding:</b> base64
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