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Comparison between microwave and conventional sintering on the properties and microstructural evolution of tetragonal zirconia (Article)

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Abstract

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In this research, the comparison between microwave sintering and conventional sintering on the mechanical properties and microstructural evolution of 3 mol% yttria-stabilised zirconia were studied. Green bodies were compacted and sintered at various temperatures ranging from 1200 °C to 1500 °C. The results showed that microwave assisted sintering was beneficial in enhancing the densification and mechanical properties of zirconia , particularly when sintered at 1200 °C. It was revealed that as the sintering temperature was increased to 1400 °C and beyond, the grain size and mechanical properties for both microwave - and conventional -sintered ceramics were comparable thus suggesting that the sintering temperature where densification mechanism was activated, grain size was strongly influenced by the sintering temperature and not the sintering mode. © 2018 Elsevier Ltd and Techna Group S.r.l.

Author keywords

Conventional sintering | Mechanical properties | Microstructure evolution | Microwave sintering | Y-TZP

Indexed keywords

Engineering controlled terms: Grain size and shape | Mechanical properties | Microstructural evolution | Microstructure | Microwave heating | Microwaves | Yttria stabilized zirconia | Yttrium oxide | Zirconia

Compendex keywords: Conventional sintering | Densification mechanisms | Micro-structure evolutions | Microwave assisted | Microwave sintering | Sintered ceramics | Sintering temperatures | Tetragonal zirconia

Engineering main heading: Sintering

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References (39)

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Ramesh, S. , Khan, M.M. , Alexander Chee, H.C.
(2016) Ceramics International

Sintering properties and low-temperature degradation behaviour of Y-TZP ceramics

Ting, C.H. , Ramesh, S. , Lwin, N.
(2016) Journal of Ceramic Processing Research

Effects of microwave sintering in aging resistance of zirconia-based ceramics

Presenda, Á. , Salvador, M.D. , Penaranda-Foix, F.L.
(2017) Chemical Engineering and Processing: Process Intensification

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Review of zirconia-based bioceramic: Surface modification and cellular response

(2016) *Ceramics International*, 42 (11), pp. 12543-12555. Cited 10 times.
doi: 10.1016/j.ceramint.2016.05.077

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2 Piconi, C., Maccauro, G.
Zirconia as a ceramic biomaterial

(1999) *Biomaterials*, 20 (1), pp. 1-25. Cited 1392 times.
doi: 10.1016/S0142-9612(98)00010-6

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3 Chevalier, J., Gremillard, L., Deville, S.
Low-temperature degradation of zirconia and implications for biomedical implants

(2007) *Annual Review of Materials Research*, 37, pp. 1-32. Cited 263 times.
ISBN: 0824317378; 978-082431737-9
doi: 10.1146/annurev.matsci.37.052506.084250

View at Publisher

4 Denry, I., Kelly, J.R.
State of the art of zirconia for dental applications

(2008) *Dental Materials*, 24 (3), pp. 299-307. Cited 753 times.
doi: 10.1016/j.dental.2007.05.007

View at Publisher

5 Vaderhobli, R., Saha, S.
Microwave sintering of ceramics for dentistry: part 2
(2015) *Dentistry*, 5, p. 1. Cited 2 times.

6 Chevalier, J., Gremillard, L.
Ceramics for medical applications: A picture for the next 20 years

(2009) *Journal of the European Ceramic Society*, 29 (7), pp. 1245-1255. Cited 318 times.
doi: 10.1016/j.jeurceramsoc.2008.08.025

View at Publisher

7 Sivakumar, G., Senthil Kumar, S.
Investigation on effect of Yttria Stabilized Zirconia coated piston crown on performance and emission characteristics of a diesel engine (Open Access)

(2014) *Alexandria Engineering Journal*, 53 (4), pp. 787-794. Cited 14 times.
http://www.elsevier.com/wps/find/journaldescription.cws_home/724292/description#description
doi: 10.1016/j.aej.2014.08.003

View at Publisher

8 Azim Jais, A., Muhammed Ali, S.A., Anwar, M., Rao Somalu, M., Muchtar, A., Wan Isahak, W.N.R., Yong Tan, C., (...), Brandon, N.P.
Enhanced ionic conductivity of scandia-ceria-stabilized-zirconia (10Sc1CeSZ) electrolyte synthesized by the microwave-assisted glycine nitrate process

(2017) *Ceramics International*, 43 (11), pp. 8119-8125. Cited 4 times.
doi: 10.1016/j.ceramint.2017.03.135

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