Analysis of particle rearrangement during sintering by micro focus computed tomography (mu CT)

Author(s): Nothe M (Noethe, M.), Schulze M (Schulze, M.), Grupp R (Grupp, R.), Kieback B (Kieback, B.), Haibel A (Haibel, A.), Banhart J (Banhart, J.)

Editor(s): Yoon DY; Kang SJL; Eun KY; Kim YS

Source: Progress in Powder Metallurgy, Pts 1 and 2 **Book Series:** MATERIALS SCIENCE FORUM **Volume:** 534-536 **Pages:** 493-496 **Published:** 2007

Times Cited: 3 **References:** 12 Citation Map

Conference Information: Power Metallurgy World Congress and Exhibition 2006
Busan, SOUTH KOREA, SEP 24-28, 2006
Korean Powder Metallurgy Inst

Abstract: The decrease of the distance between particle centers due to the growth of the sinter necks can be explained by the well known two-particle model. Unfortunately this model fails to provide a comprehensive description of the processes for 3D specimens. Furthermore, there is a significant discrepancy between the calculated and the measured shrinkage because particle rearrangements are not considered. Only the recently developed analysis of the particle movements inside of 3D specimens using micro focus computed tomography (mu CT), combined with photogrammetric image analysis, can deliver the necessary experimental data to improve existing sintering theories. In this work, mu CT analysis was applied to spherical copper powders. Based on photogrammetric image analysis, it is possible to determine the positions of all particle centers for tracking the particles over the entire sintering process and to follow the fort-nation and breaking of the particle bonds. In this paper, we present an in-depth analysis of the obtained data. In the future, high resolution synchrotron radiation tomography will be utilized to obtain in-situ data and images of higher resolution.

Document Type: Proceedings Paper

Language: English

Author Keywords: sintering; cooperative material transport; tomography; image analysis

Reprint Address: Nothe, M (reprint author), Tech Univ Dresden, Inst Mat Sci, D-8027 Dresden, Germany

Cited by: 3

This article has been cited 3 times (from Web of Science).

Olmos L, Takahashi T, Bouvard D, et al. Analysing the sintering of heterogeneous powder structures by in situ microtomography PHILOSOPHICAL MAGAZINE 89 32 2949-2965 2009

Olmos L, Martin CL, Bouvard D, et al. Investigation of the Sintering of Heterogeneous Powder Systems by Synchrotron Microtomography and Discrete Element Simulation JOURNAL OF THE AMERICAN CERAMIC SOCIETY 92 7 1492-1499 JUL 2009

Grupp R, Henkel F, Nothe M, et al. A 1800 K furnace designed for in situ synchrotron microtomography JOURNAL OF SYNCHROTRON RADIATION 16 524-527 Part 4 JUL 2009

[view all 3 citing articles]

Create Citation Alert

Related Records:

Find similar records based on shared references (from Web of Science).

[view related records]

References: 12

View the bibliography of this record (from Web of Science).

Additional information

- View the journal's impact factor (in Journal Citation Reports)

Suggest a correction

Addresses:
1. Tech Univ Dresden, Inst Mat Sci, D-8027 Dresden, Germany

Publisher: TRANS TECH PUBLICATIONS LTD, LAUBLSRUTISTR 24, CH-8717 STAFA-ZURICH, SWITZERLAND

Subject Category: Materials Science, Multidisciplinary

IDS Number: BFT53

ISSN: 0255-5476

ISBN: 978-0-87849-419-4

Output Record

Step 1:

- Authors, Title, Source
  - plus Abstract
- Full Record
  - plus Cited Reference

Step 2: [How do I export to bibliographic management software?]

Print | E-mail | Add to Marked List | Save to EndNote Web | Save to EndNote, RefMan, ProCite

Save to other Reference Software | Save

View in 简体中文 English