

Winter 3-11-2016

Self-organized structure in current-activated pressure-assisted densification (CAPAD)

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Recommended Citation

[1] D. Schwesig et al., Nanotechnology 22(13):135601, 2011 [2] O. Guillon et al., Adv. Eng. Mater. 16(7):830, 2014 [3] S. Angst, D.E. Wolf, preprint (2015)

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Using nanostructured thermoelectrics led to a significant improvement of the figure of merit. An easily upscalable and cheap way of producing nanostructured bulk material is current-activated pressure-assisted densification (CAPAD). This process is quite complex and it has been shown that the powder morphology gives a feedback to the process itself [1,2]. We investigated the influence of particle properties of binary mixtures on the evolving structure. For this purpose we use a network model [3] based on the Onsager-de Groot-Callen theory. In the simulations we find that depending on the difference between the Seebeck coefficients of both materials either a well mixed or a segregated sintered structure is obtained.

[1] D. Schwesig et al., *Nanotechnology* 22(13):135601, 2011

[2] O. Guillon et al., *Adv. Eng. Mater.* 16(7):830, 2014

[3] S. Angst, D.E. Wolf, preprint (2015)