Accepted Manuscript

Rapid synthesis of alpha calcium sulfate hemihydrate whiskers in glycerol-water solution by using flue-gas-desulfurization gypsum solid waste

Weili Teng, Jinshu Wang, Junshu Wu, Yucheng Du, Xin-Jian Jia, Hongyi Li, Tianning Wang

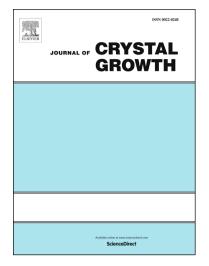
PII: S0022-0248(18)30220-3

DOI: https://doi.org/10.1016/j.jcrysgro.2018.05.008

Reference: CRYS 24596

To appear in: Journal of Crystal Growth

Received Date: 30 January 2018 Revised Date: 8 May 2018 Accepted Date: 9 May 2018



Please cite this article as: W. Teng, J. Wang, J. Wu, Y. Du, X-J. Jia, H. Li, T. Wang, Rapid synthesis of alpha calcium sulfate hemihydrate whiskers in glycerol-water solution by using flue-gas-desulfurization gypsum solid waste, *Journal of Crystal Growth* (2018), doi: https://doi.org/10.1016/j.jcrysgro.2018.05.008

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Rapid synthesis of alpha calcium sulfate hemihydrate whiskers in glycerol-water solution by using flue-gas-desulfurization gypsum solid waste

Weili Teng, Jinshu Wang*, Junshu Wu*, Yucheng Du, Xin-Jian Jia, Hongyi Li,

Tianning Wang

College of Materials Science and Engineering, Beijing University of Technology,
Chaoyang District, Beijing 100124, China

* Corresponding author. E-mail: wangjsh@bjut.edu.cn; Tel: +86-10-67391101

* Corresponding author. E-mail: junshuwu@bjut.edu.cn; Tel: +86-18810370731

Abstract: The feasibility of fabricating alpha calcium sulfate hemihydrate (α -CSH) whiskers by using flue-gas-desulfurization (FGD) gypsum as source materials was studied. Crystal phase- and morphology-controlled crystallization of gypsum were realized in the designed glycerol-water reaction system. L-glutamic acid was found to accelerate the conversion of calcium sulfate dihydrate (CSD) into α -CSH whiskers by intercalating into layered CSD structure. The time-dependent experiments indicate rod-like CSD first splits into layered structure and then fascicular structure and finally single crystals. The splitting crystallization owing to lattice expansion of CSD generates α -CSH whiskers with a high aspect ratio (\sim 1:200). The facile method to convert FGD gypsum solid waste into CSD and finally α -CSH whiskers may prove particularly useful in the design of recyclable FGD gypsum with significant environmental impact, and it is particularly important in environmental remediation and green economics.

Download English Version:

https://daneshyari.com/en/article/8148398

Download Persian Version:

https://daneshyari.com/article/8148398

<u>Daneshyari.com</u>