## **Accepted Manuscript**

Synthesis of sole cancrinite phase from raw muscovite: Characterization and optimization

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PII: S0925-8388(18)31908-X

DOI: 10.1016/j.jallcom.2018.05.195

Reference: JALCOM 46171

To appear in: Journal of Alloys and Compounds

Received Date: 10 March 2018
Revised Date: 15 May 2018
Accepted Date: 17 May 2018

Please cite this article as: A.Q. Selim, E.A. Mohamed, M.K. Seliem, A.M. Zayed, Synthesis of sole cancrinite phase from raw muscovite: Characterization and optimization, *Journal of Alloys and Compounds* (2018), doi: 10.1016/i.jallcom.2018.05.195.

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## ACCEPTED MANUSCRIPT

1	Synthesis of sole cancrinite phase from raw muscovite: Characterization and
2	optimization
3	Ali Q. Selim <sup>a</sup> , Essam A. Mohamed <sup>a</sup> , Moaaz K. Seliem <sup>b</sup> , Ahmed M. Zayed <sup>b*</sup>
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6	
7	Abstract
8	Sole phase of cancrinite was synthesized for the first time from raw muscovite via
9	NaOH activation followed by hydrothermal treatment. The effects of different
10	experimental parameters including alkali concentration, crystallization time and
11	temperature on the as-synthesized products were investigated. The raw and the as-
12	synthesized products were characterized by X-ray diffraction (XRD), scanning
13	electron microscopy (SEM) and Fourier transform infrared spectroscopy (FT-IR). The
14	optimum hydrothermal treatment conditions to synthesize cancrinite were 1:2
15	muscovite/NaOH ratio, 250 °C for 72 h. Dissolution of Si and Al from muscovite
16	followed by nucleation and precipitation of silicate, aluminate and aluminosilicate
17	species from solution is the main mechanism of cancrinite growth.
18	Keywords: hydrothermal treatment, cancrinite, neucleation, transformation, crystal
19	growth
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25	1. Introduction

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