## Accepted Manuscript

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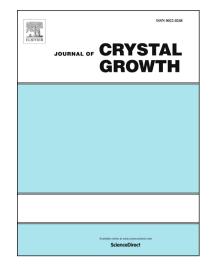
PII: S0022-0248(17)30632-2

DOI: https://doi.org/10.1016/j.jcrysgro.2017.10.025

Reference: CRYS 24345

To appear in: Journal of Crystal Growth

Received Date: 18 September 2017 Revised Date: 16 October 2017 Accepted Date: 19 October 2017



Please cite this article as: L. Vasenko, H. Qu, Calcium phosphates recovery from digester supernatant by fast precipitation and recrystallization, *Journal of Crystal Growth* (2017), doi: https://doi.org/10.1016/j.jcrysgro. 2017.10.025

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## ACCEPTED MANUSCRIPT

Calcium phosphates recovery from digester supernatant by fast precipitation and recrystalli-

zation

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**Abstract** 

Conditional solubility of dicalcium phosphate dihydrate (DCPD) and hydroxyapatite (HAp) in di-

gester supernatant was determined as a function of pH and was compared to its conditional solubil-

ity in distilled water. Conditional solubility of both substances in digester supernatant at pH >5-6

was higher than their conditional solubility in pure water due to the presence of impurities, and this

influence is more significant for HAp. Amorphous CaP was precipitated through a fast precipita-

tion process from digester supernatant with initial total phosphate concentration 0.008 mol/L and

0.015 mol/L and Ca/P ratios 2 and 5 respectively. The amorphous CaP can be subsequently recrys-

tallized into crystalline CaP. Obtained amorphous products have Ca/P ratio > 1, which allow per-

forming the recrystallization process without further Ca dosing into the system. Batch recrystalliza-

tion of the amorphous products resulted in crystallization of HAp, DCPD or their mixture depend-

ing on the conditions of the process. Maximum achieved P-recovery was 69.5 %. The increase of

phosphate concentration and the addition of seeding decreased the yield of the process but promot-

ed crystallization of DCPD. The increase of Ca/P ratio had a positive effect on the total P-

recovery. Compared with the direct batch crystallization of CaP from digester supernatant, the

two-step process with fast precipitation and recrystallization significantly improved the color of the

obtained products.

Keywords A1. Phosphorous recovery; A1. Precipitation; A1. Recrystallization; B1. Digester super-

natant; B1. Dicalcium phosphate dihydrate; B1. Hydroxyapatite.

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