

## Electronic Supplementary Information for:

### Post-isomorphic substitution of trivalent metal cations for $\text{Ca}^{2+}$ in portlandite crystals

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**Content:** Figures S1-S5

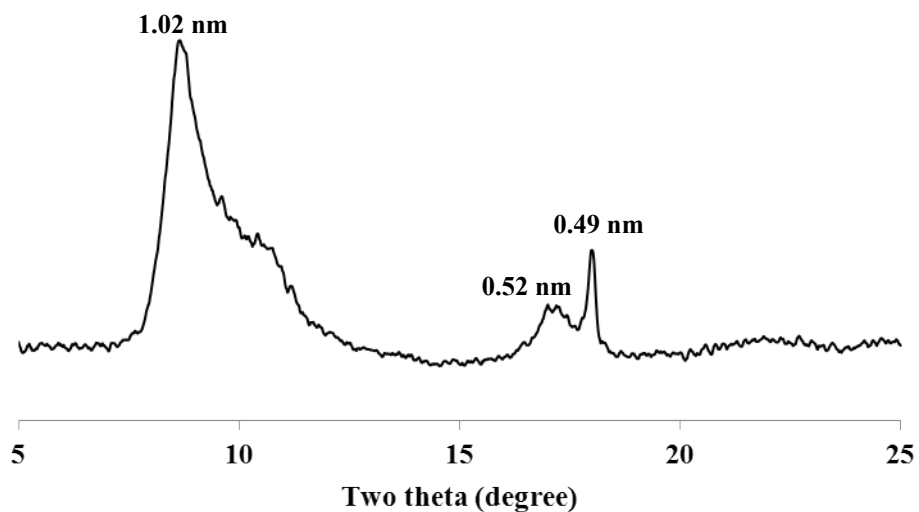
**Fig. S1.** XRD pattern of the solid phase reacted at  $\text{Ca}^{2+}/\text{Fe}^{3+} = 5.0$  by a fast addition (flow rate > 2.0 ml/min).

**Fig. S2.** Water solubility of portlandite and CaFe-Cl LDH. Water solubility was evaluated by measuring the weight of the solid collected by centrifugation and dried at 105 °C whereas the suspension pH was used for calculation of water solubility.

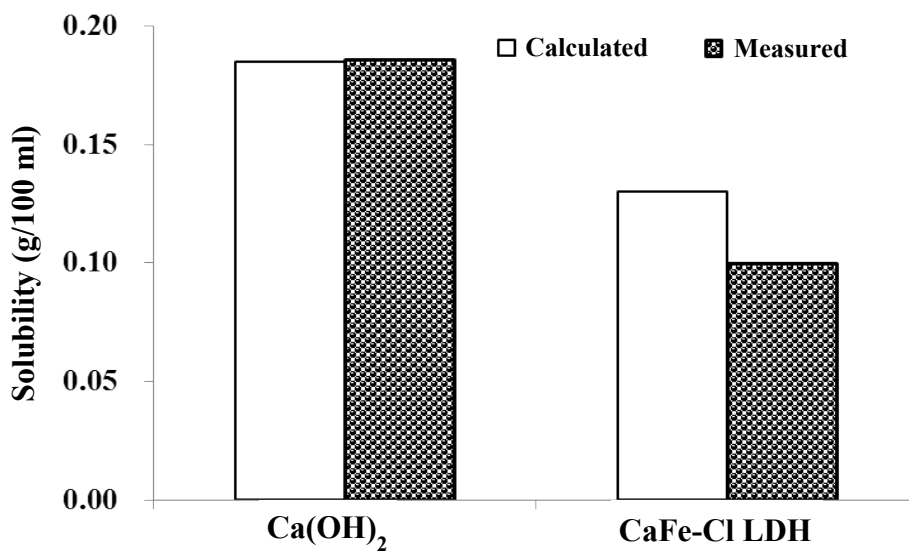
**Fig. S3.** Change in suspension pH of portlandite (50 ml of 0.2 mole/L) with addition of 0.1M  $\text{Al}(\text{NO}_3)_3$  solution.

**Fig. S4.** SEM image of platelet-shaped portlandite reacted with  $\text{Cr}^{3+}$  at  $\text{Ca}^{2+}/\text{Cr}^{3+} = 4.0$ .

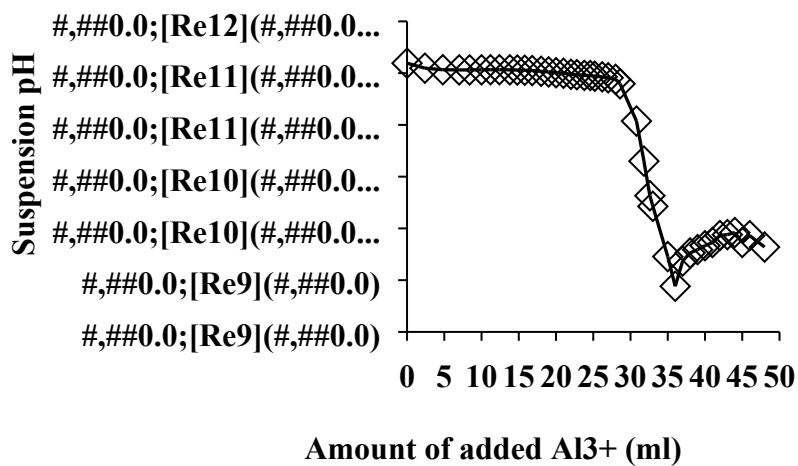
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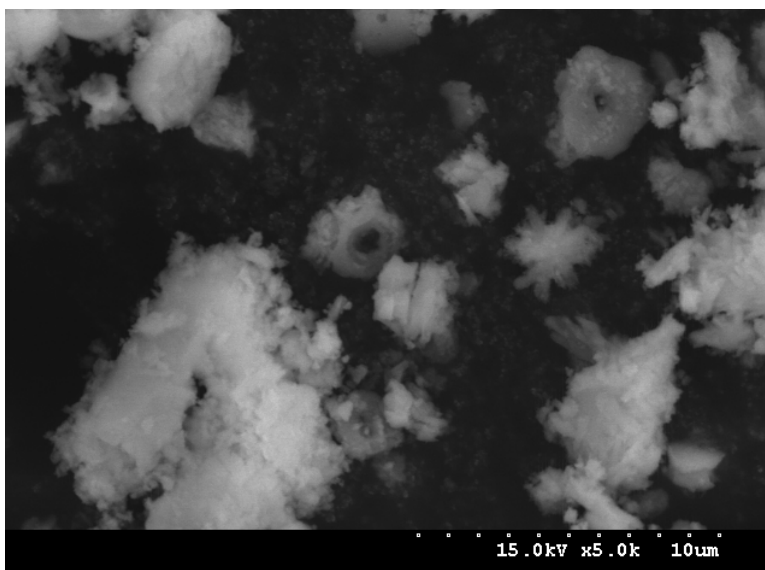
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**Fig. S4.** SEM image of platelet-shaped portlandite reacted with  $\text{Cr}^{3+}$  at  $\text{Ca}^{2+}/\text{Cr}^{3+} = 4.0$ .



(The nearly same images, tiny particulates, were also obtained from tablet-shaped portlandite)