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## **Supporting information**

Here we give some additional results which may be useful in interpreting the data presented in the main paper. Fig S1 is to be read with Fig 4 in the main paper; while concentration profiles are shown in Fig 4 presents the percentages of Ca and Mg extracted. Fig S2 shows the results from TGA referred to in section 4.4.

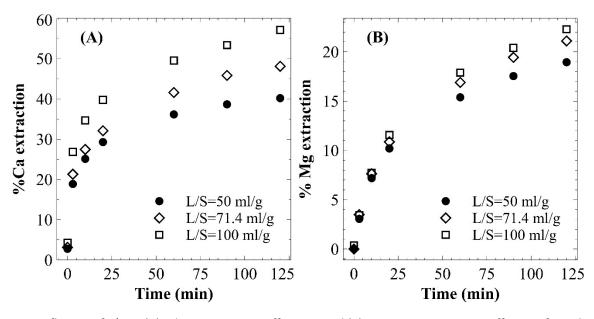


Fig. S1 Influence of L/S on (A) calcium extraction efficiency, and (B) magnesium extraction efficiency from the BOF slag

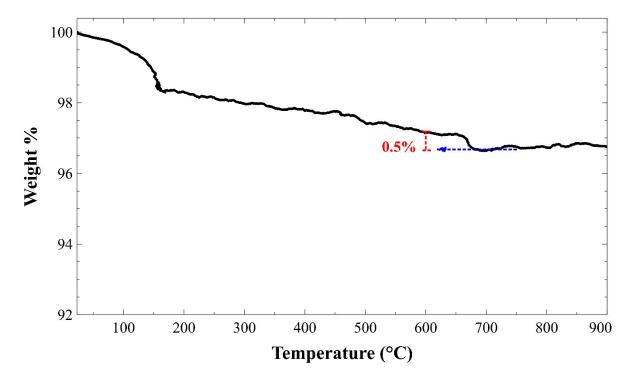


Fig. S2 Thermogravimetric analysis (TGA) curve for slag residue (90–125  $\mu$ m) obtained after 240 min of dissolution (L/S = 10mml/g, initial CO<sub>2</sub> Pressure = 12.4 bar)

The 0.5% weight loss observed in the Fig. S2 is insignificant. If the supersaturated solution discharged as precipitation during dissolution step, corresponding weight loss would be upside of 15%.