

Supplementary Material

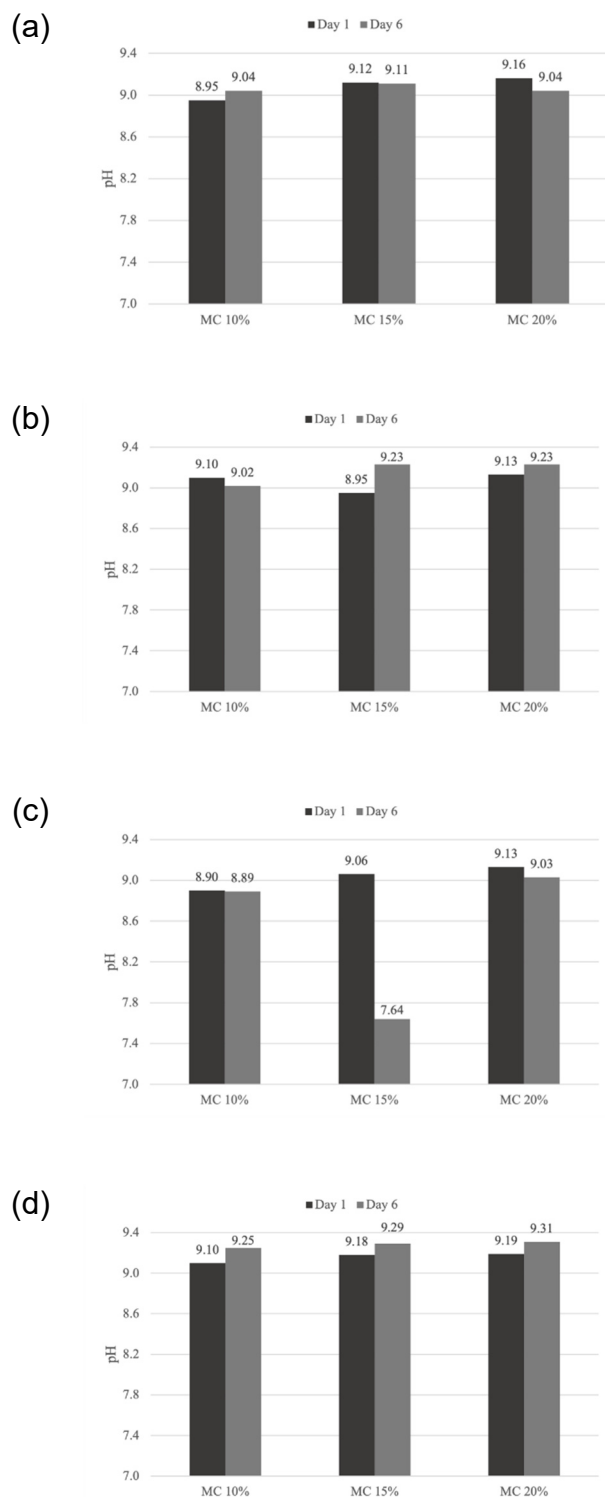


Figure S1. pH of carbonated kimberlite after incubator carbonation (24 h and 144 h) at 10 % CO₂ and reaction temperatures of (a) 35 °C and (b) 50 °C, and at 20 % CO₂ and reaction temperatures of (c) 35 °C and (d) 50 °C; where MC represents moisture content. pH of unreacted kimberlite is 9.2. The value of 7.64 in Figure S1c is considered an outlier.

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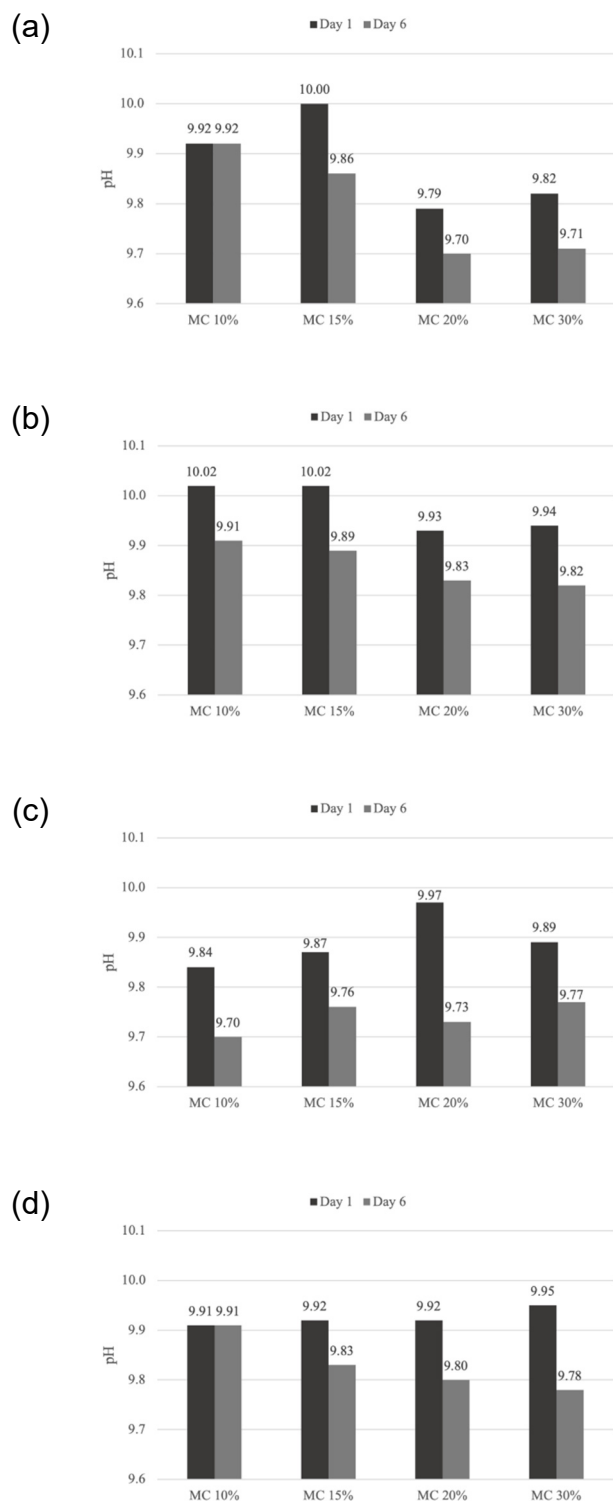


Figure S2. pH of carbonated wollastonite after incubator carbonation (24 h and 144 h) at 15 % CO₂ and reaction temperatures of (a) 35 °C and (b) 50 °C and at 20 % CO₂ and reaction temperatures of (c) 35 °C and (d) 50 °C; where MC represents moisture content. pH of unreacted wollastonite is 10.0.

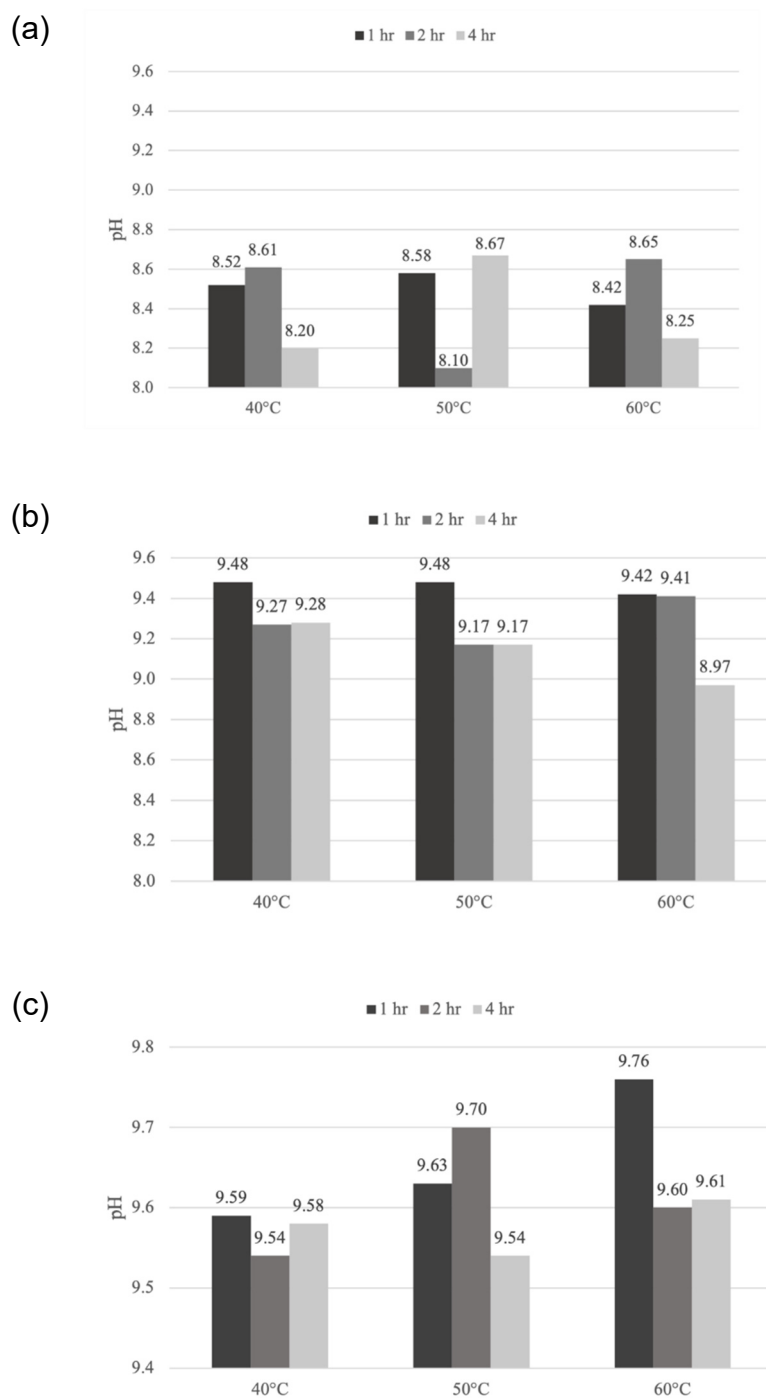


Figure S3. pH of carbonated (a) kimberlite, (b) heat treated kimberlite, and (c) wollastonite after slurry carbonation in ultrapure water. pH of unreacted kimberlite, heat treated kimberlite, and wollastonite are 9.2, 9.0, and 10.0, respectively.

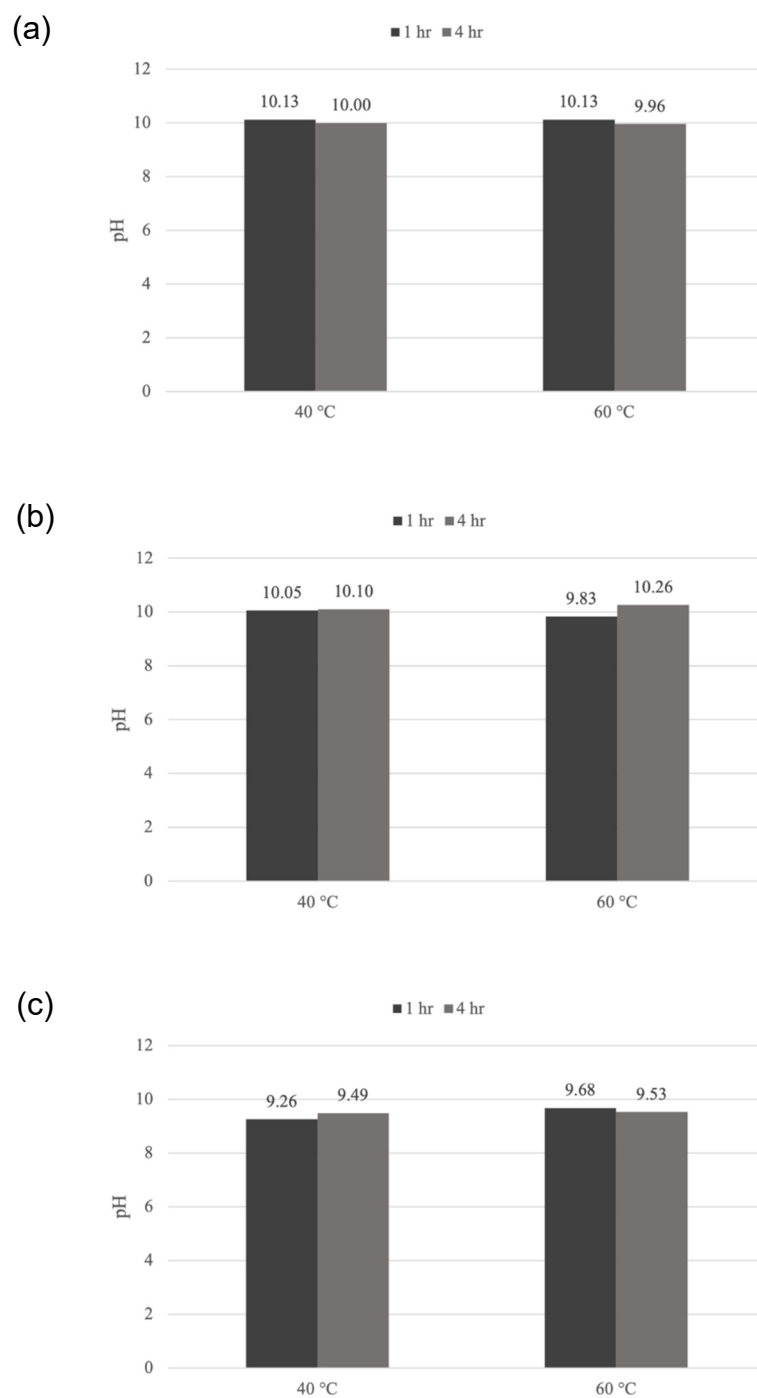


Figure S4. pH of (a) kimberlite, (b) heat treated kimberlite, and (c) wollastonite after slurry carbonation in 0.64 M NaOH. pH of unreacted kimberlite, heat treated kimberlite, and wollastonite are 9.2, 9.0, and 10.0, respectively.

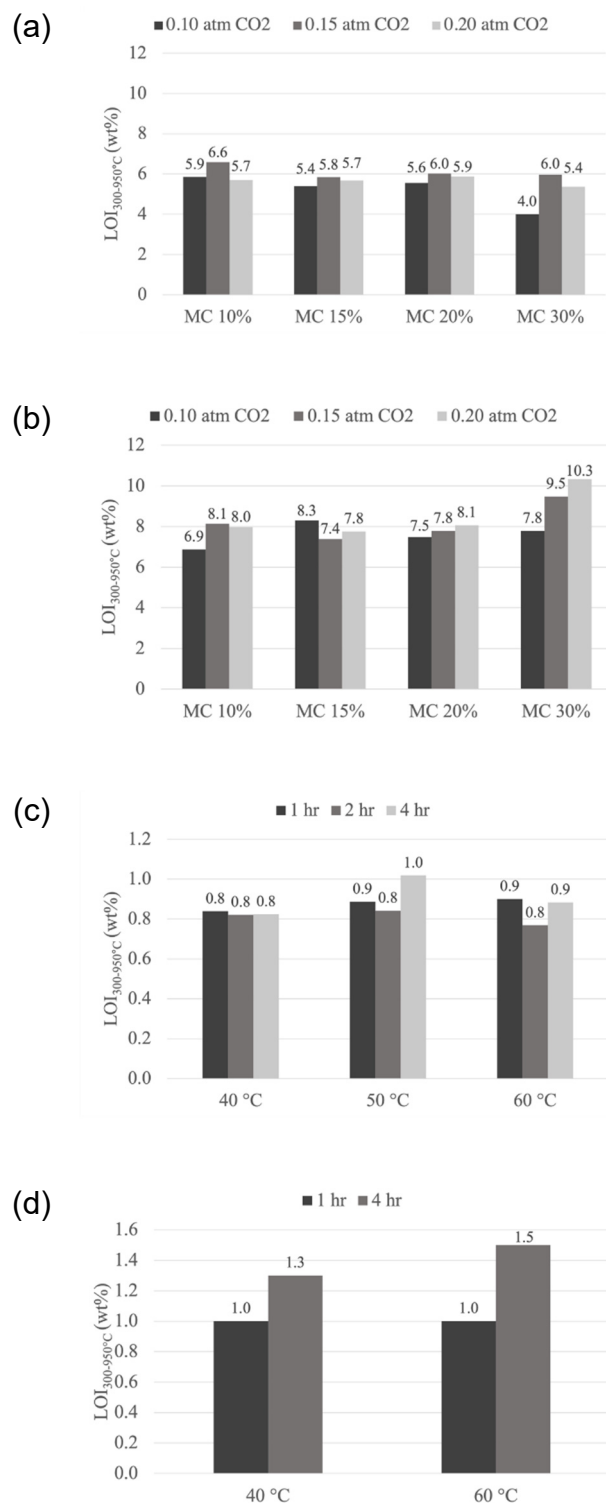


Figure S5. CO₂ content (LOI_{300-950°C}) of incubator carbonated (144 hr) wollastonite at (a) 35 °C and (b) 50 °C and slurry carbonated wollastonite in (c) ultrapure water and (d) NaOH. CO₂ content (LOI_{300-950°C}) of unreacted wollastonite is 0.80 wt%.

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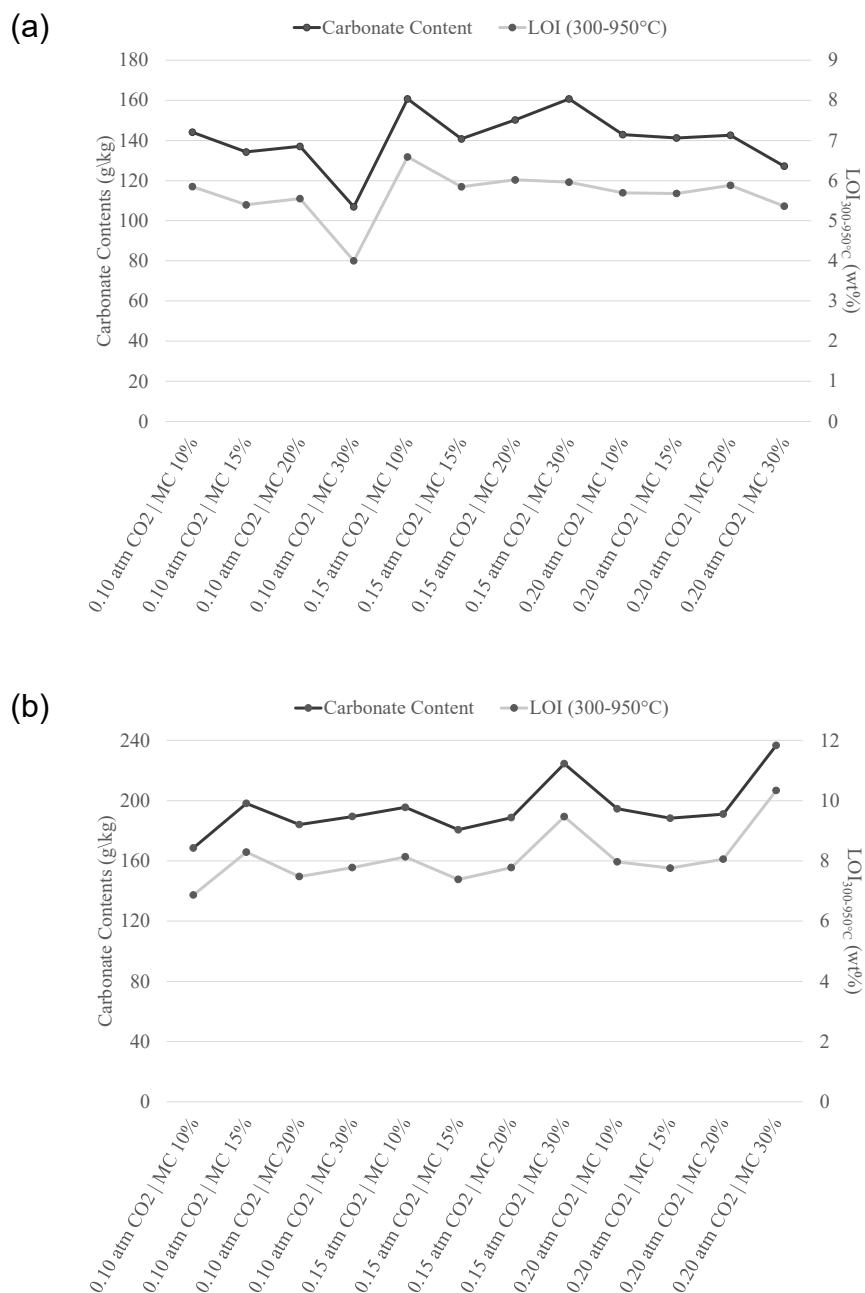


Figure S6. Comparison between calcimeter and furnace test results. Wollastonite carbonated using incubator carbonation at (a) 35 °C and (b) 50 °C.