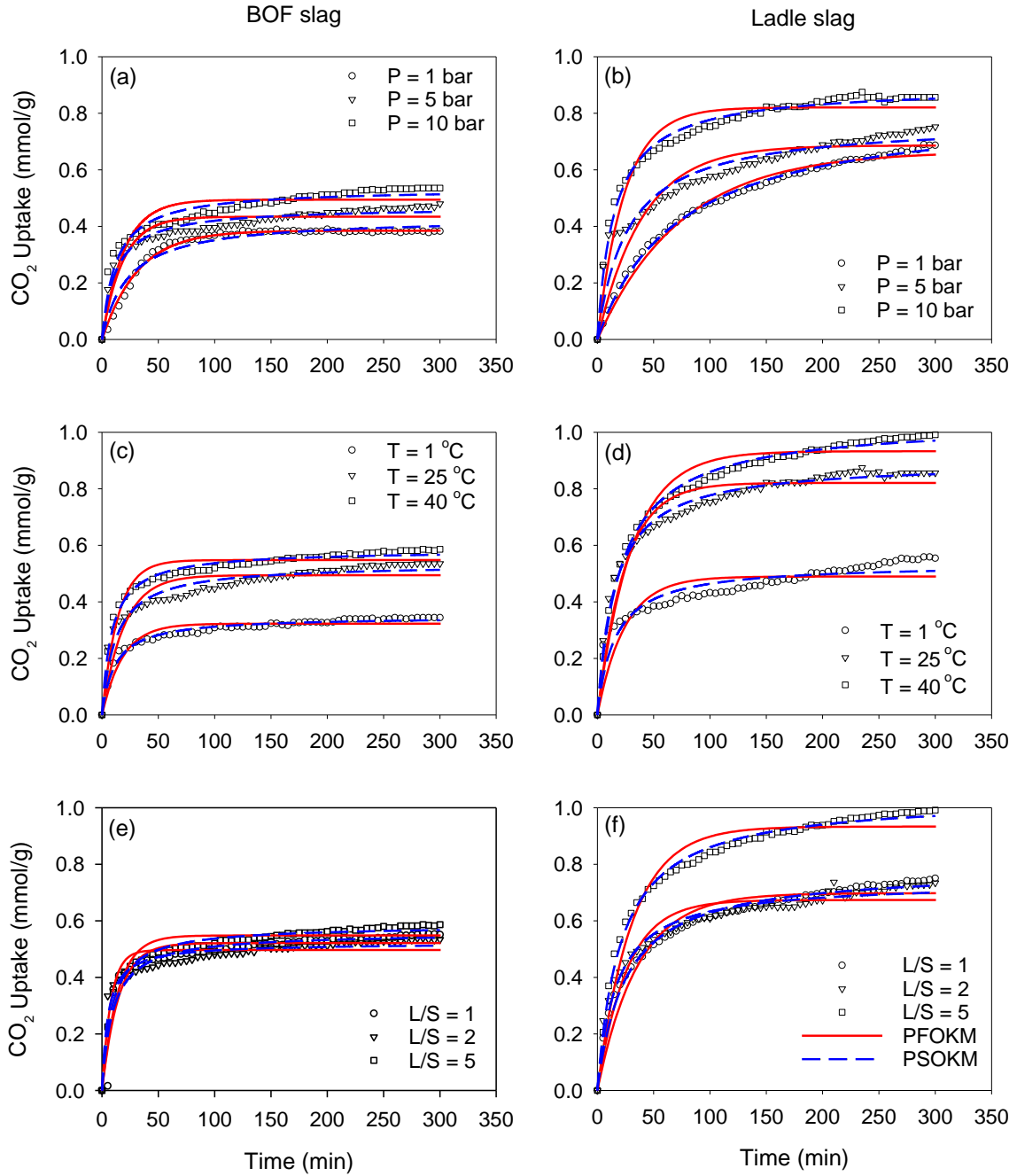


## Supplementary Materials

The results of physicochemical characteristic of soils and slags are provided in Table S1. A detailed description of the CO<sub>2</sub> uptake kinetics results is provided in Fig. S1.

**Table S1.** Physicochemical Characteristic of Soils and Slags

Soils Properties	Soil A	Soil B	
pH	6.75	5.70	
Water holding capacity (WHC, %)	41.20	40.00	
Water content (%)	13.21	1.02	
Organic carbon (wt.%)	0.77	0.44	
CEC (meq/100 g)	17.05	11.95	
	Ni	0	16.3
	Pb	3,418	122,200
	Cd	853	438
<b>Heavy metals</b>	Cr	0	40
	Cu	770	7,583
	Ni	0	16.3
	Zn	17,520	1,286



**Fig. S1.** The CO<sub>2</sub> uptake kinetics results; the effect of pressure on (a) BOF and (b) Ladle slag carbonation (T = 25°C, L/S = 5); the effect of temperature on (c) BOF and (d) Ladle slag carbonation (P = 10 bar, L/S = 5); the effect of L/S ratio on (e) BOF and (f) Ladle slag carbonation (T = 40°C, P = 10 bar). Solid and dash lines represent PFOKM and PSOKM, respectively.