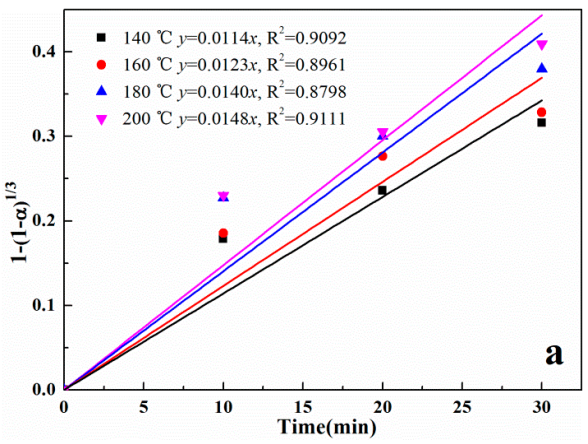
Supporting Information

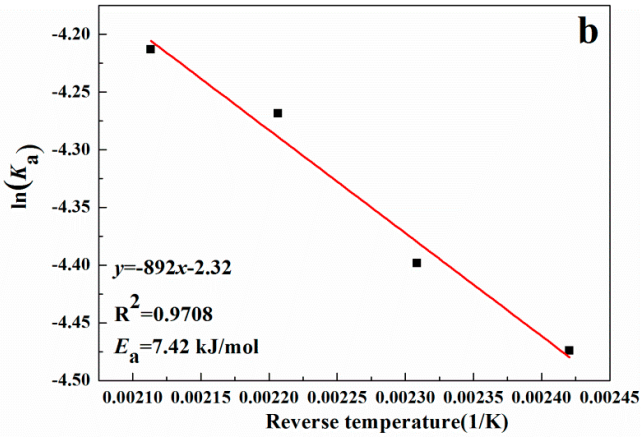
Table S1 Recovery ratio (wt. %) of alkali extraction on time with pure CaO as addition under different temperatures

Temperature/℃	Time/min		
	10	20	30
140	44.573	55.386	68.007
160	45.982	62.128	69.703
180	53.842	65.737	76.124
200	54.365	66.498	79.369

Table S2 Recovery ratio (wt. %) of alkali extraction on time with pure MgO as addition under different temperatures

Temperature/℃	Time/min		
	10	20	30
140	8.330	16.643	22.546
150	8.476	17.713	25.559
160	10.397	20.820	32.049
180	19.094	38.683	55.343
200	26.606	39.285	46.123
205	30.714	40.656	46.231
210	29.667	42.079	48.937
220	30.578	40.180	50.992





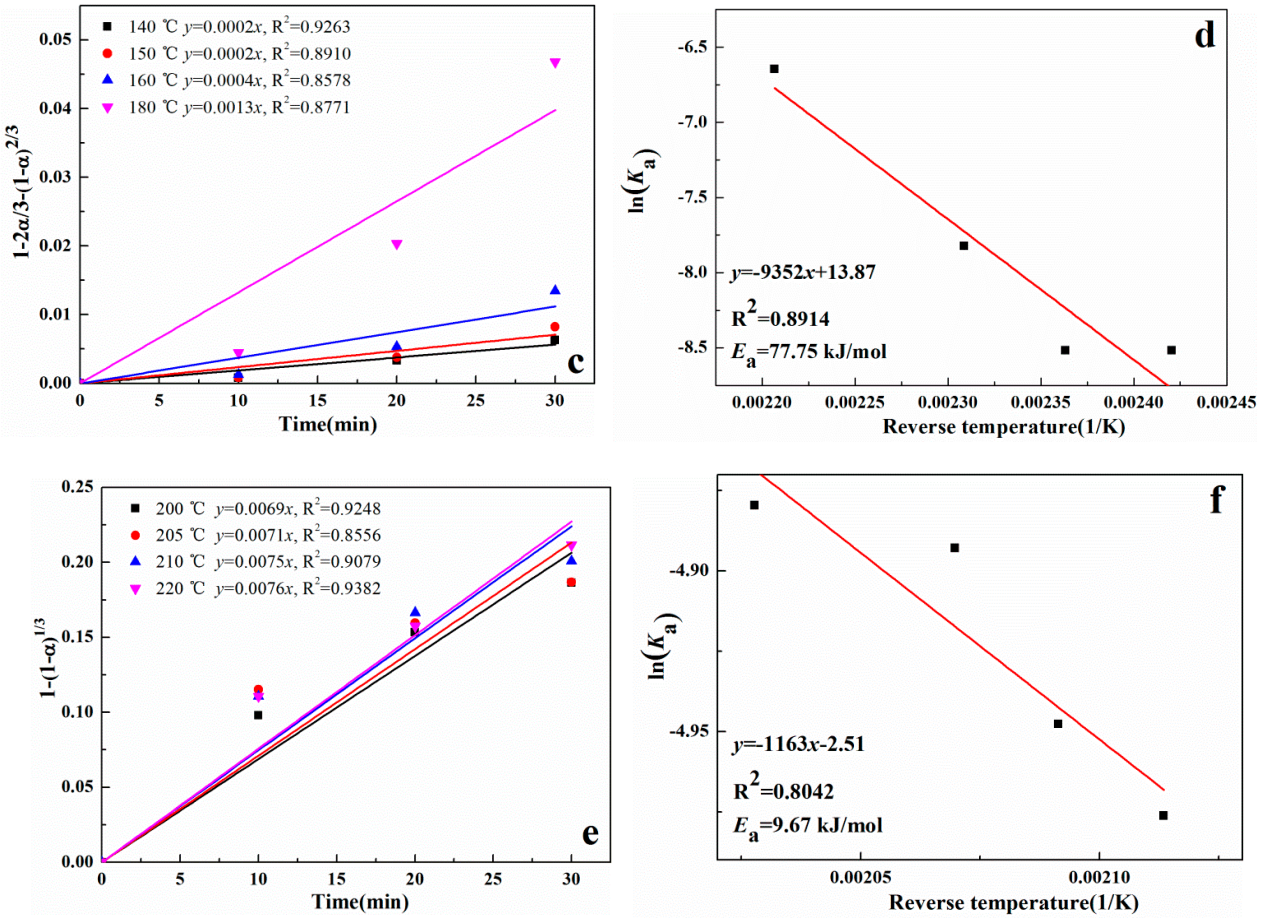


Figure S1 Kinetic fitting of (a) the plots of $[1-(1-\alpha)^{1/3}]$ versus time for CaO, (b) $\ln(K_a)$ versus temperature for CaO, (c) the plots of $[1-\frac{2}{3}\alpha-(1-\alpha)^{2/3}]$ versus time for MgO lower than 200 °C, (d) $\ln(K_a)$ versus temperature for MgO lower than 200 °C, (e) the plots of $[1-(1-\alpha)^{1/3}]$ versus time for MgO higher than 200 °C and (f) $\ln(Ka)$ versus temperature for MgO higher than 200 °C.