**Supporting Information**

**New insights into the enhancement effect of exogenous calcium on biochar stability during its aging in farmland soil**

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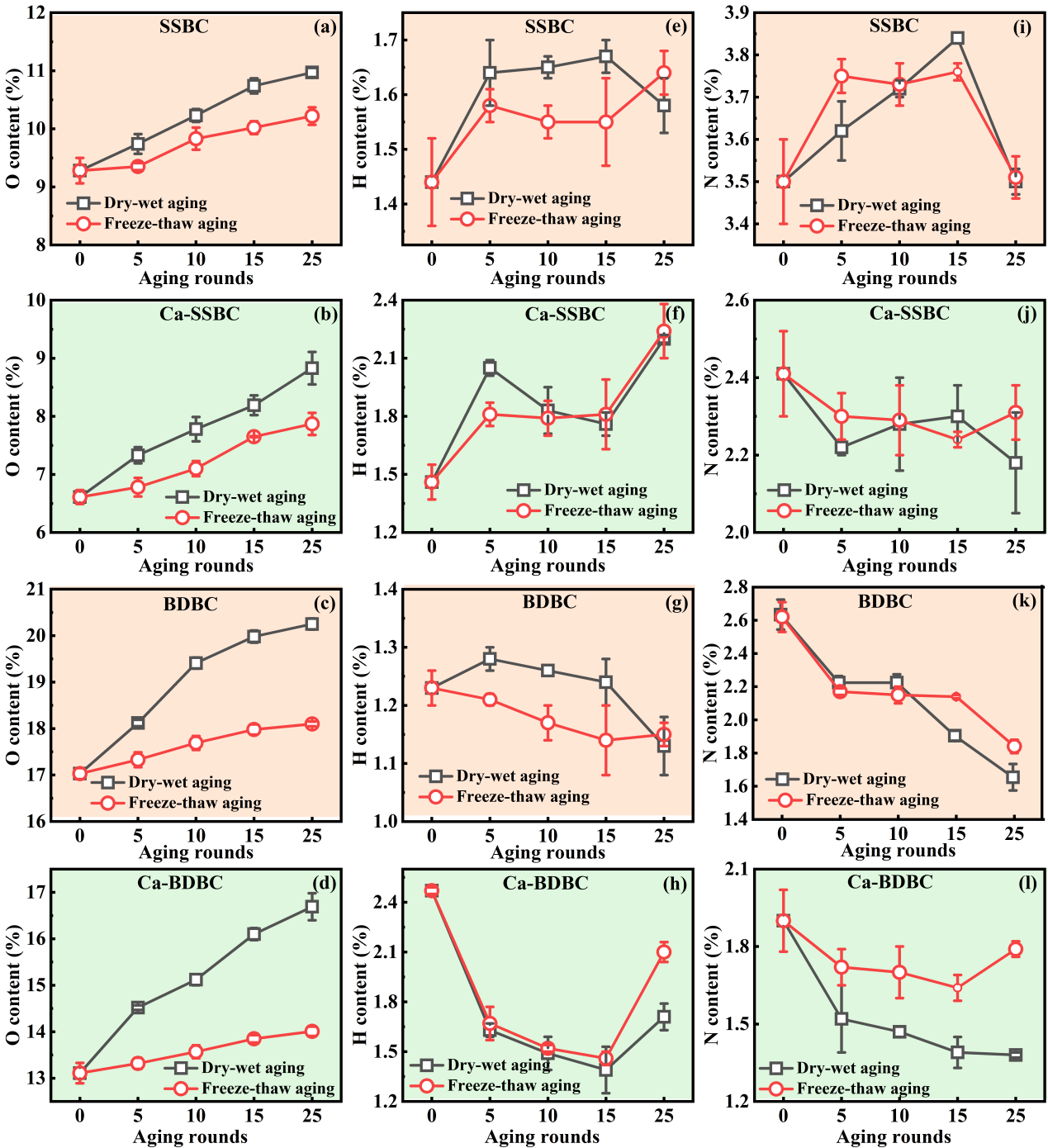
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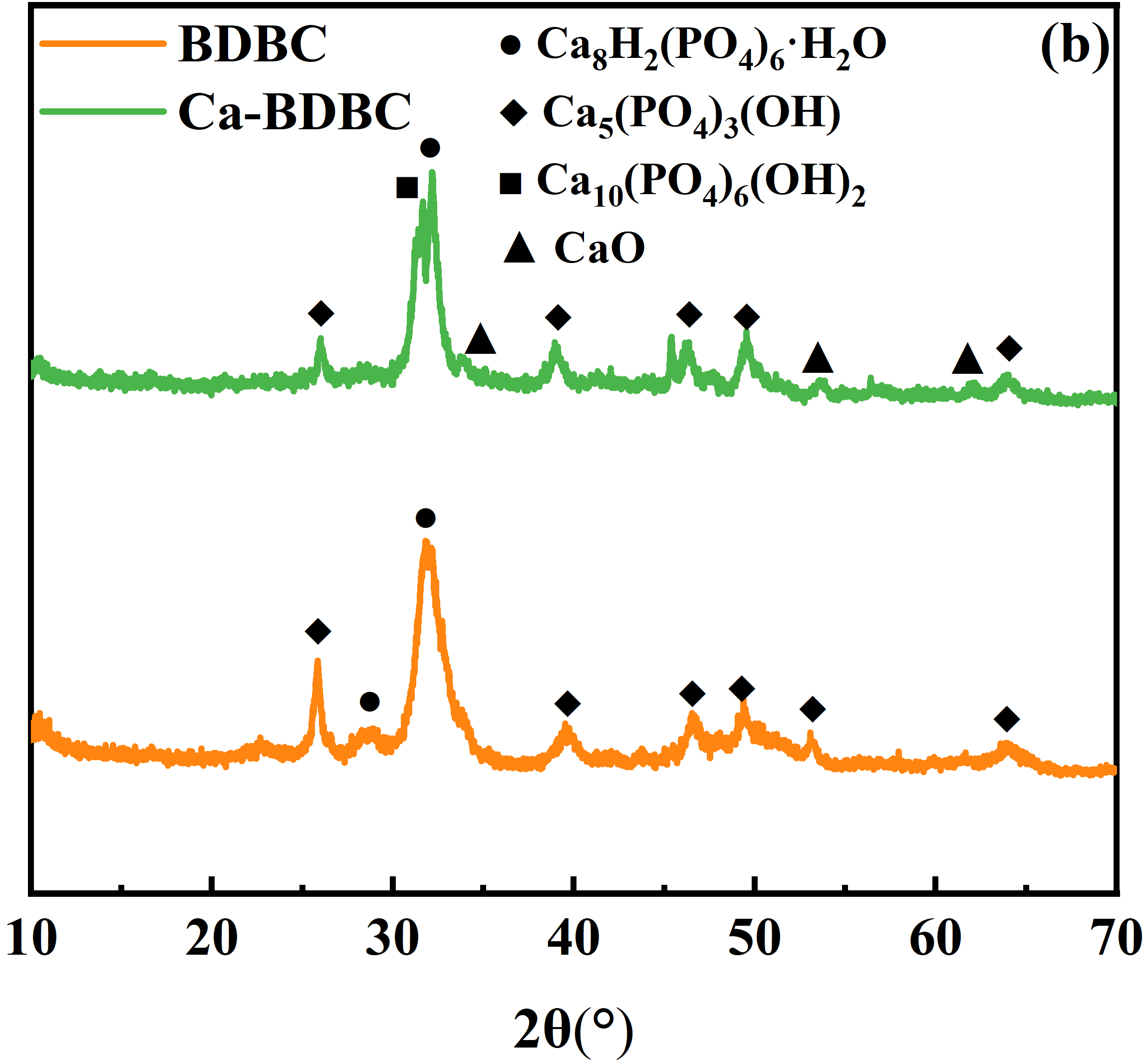
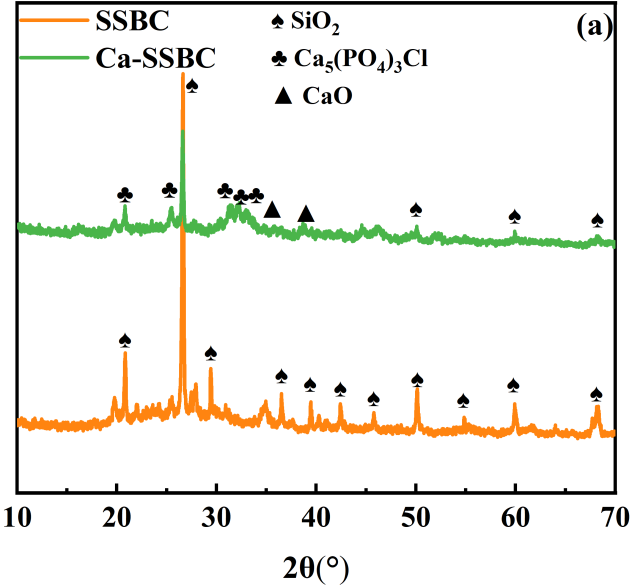
**Table S1.** Main element contents and pore structure parameters of four biochars.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Biochar | Ash  % | C  % | O  % | H  % | N  % | Ca  g·kg-1 | SA-N2 m2·g–1 | PS nm |
| SSBC | 54.3±1.2 | 24.2±0.1 | 9.28±0.2 | 1.44±0.2 | 3.50±0.1 | 17.8±1.2 | 8.50 | 2.18 |
| Ca-SSBC | 60.1±0.8 | 19.1±0.1 | 6.61±0.1 | 1.46±0.1 | 2.41±0.1 | 96.6±3.2 | 6.04 | 4.22 |
| BDBC | 55.3±0.1 | 17.2±0.7 | 17.0±0.1 | 1.23±0.1 | 2.63±0.1 | 99.4±7.2 | 89.6 | 9.73 |
| Ca-BDBC | 83.8±0.4 | 12.5±0.9 | 13.1±0.2 | 2.47±0.2 | 1.90±0.2 | 153±10.7 | 119.7 | 6.79 |

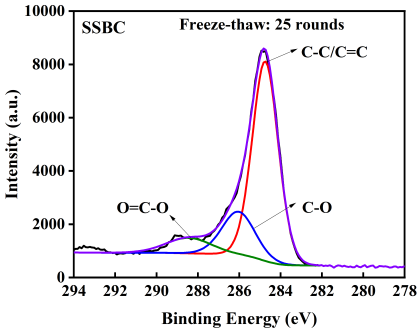
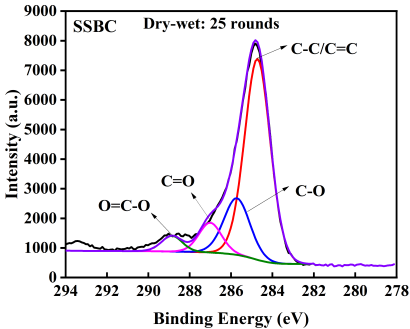
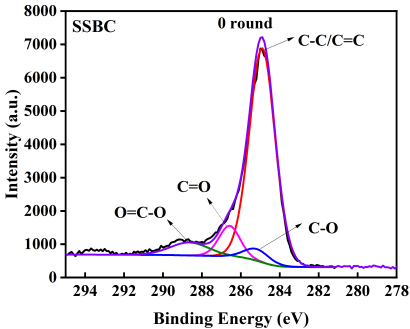
SSBC: sewage sludge biochar; Ca-SSBC: CaCl2+sewage sludge biochar; BD: bone dreg biochar; Ca-BDBC: CaCl2+bone dreg biochar; SA: BET-N2 surface area; PS: pore size.

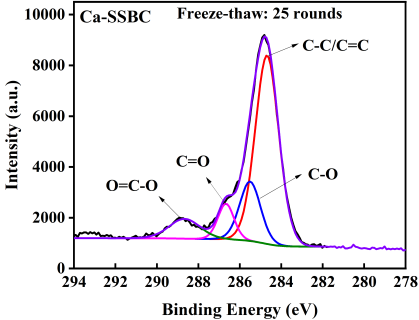
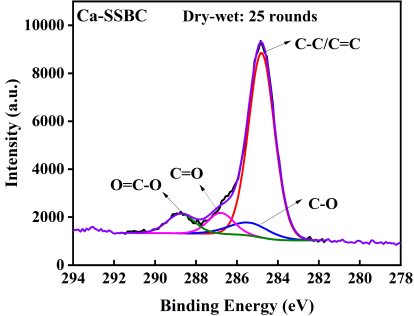
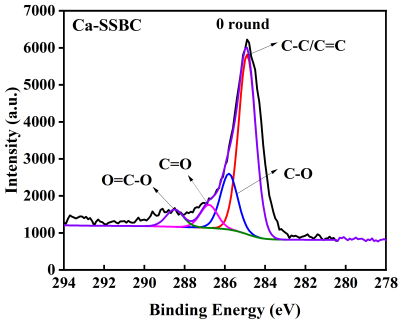


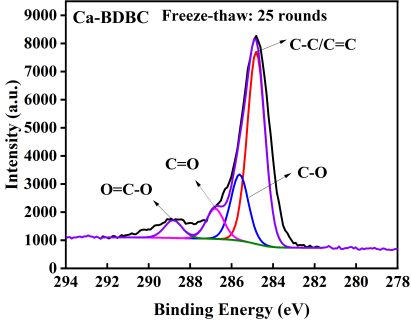
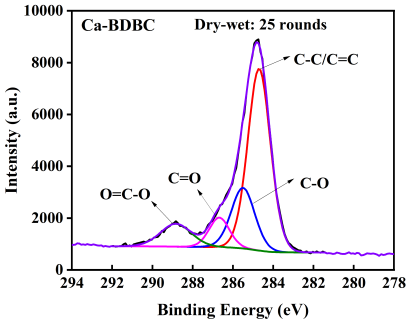
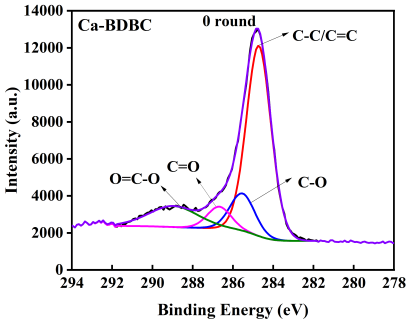
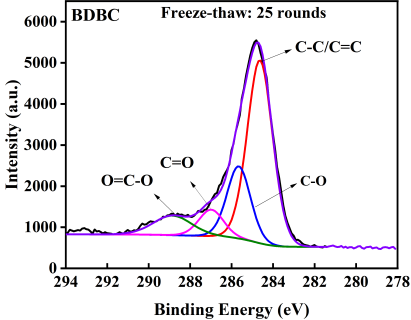
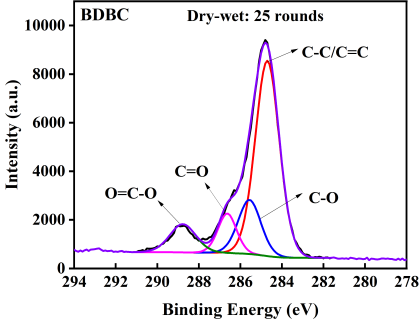
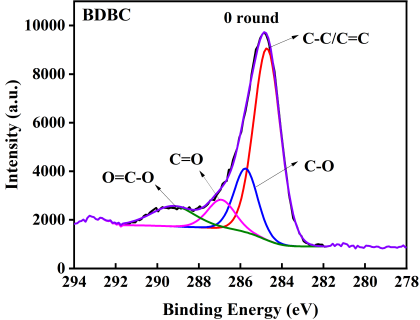
**Figure S1.** Variations of oxygen (O), hydrogen (H), and nitrogen (N) element contents in pristine biochar and Ca-rich biochar under different aging processes (n=3) (SSBC: sewage sludge biochar; BDBC: bone dreg biochar; Ca-SSBC: CaCl2+sewage sludge biochar; Ca-BDBC: CaCl2+bone dreg biochar)



**Figure S2.** Surface crystals compositions of pristine biochar (SSBC: sewage sludge biochar; BDBC: bone dreg biochar) and Ca-rich biochar (Ca-SSBC: CaCl2+sewage sludge biochar; Ca-BDBC: CaCl2+bone dreg biochar).







**Figure S3.** Surface carbon functional groups of pristine biochar and Ca-rich biochar with different aging processes (SSBC: sewage sludge biochar; BDBC: bone dreg biochar; Ca-SSBC: CaCl2+sewage sludge biochar; Ca-BDBC: CaCl2+bone dreg biochar)