Supplementary Materials

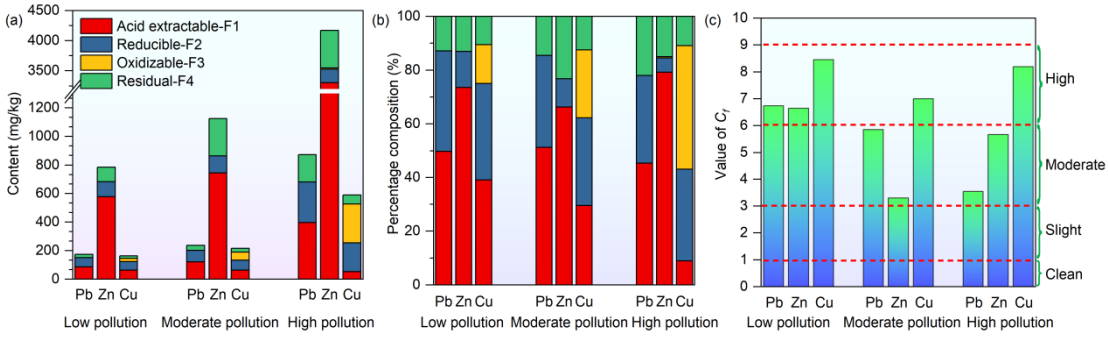

Fig. S1. The test results of heavy metals in different pollutions of coal gangue; (a) the detection and accumulation diagram of heavy metals in different contaminated coal gangue samples, (b) the detection percentage diagram of heavy metals in different contaminated coal gangue samples, (c) the comparison diagram of the C_f values of heavy metals in different contaminated coal gangue samples, and the red dotted line in Figure (c) represents the corresponding grade of the pollution coefficient [1].

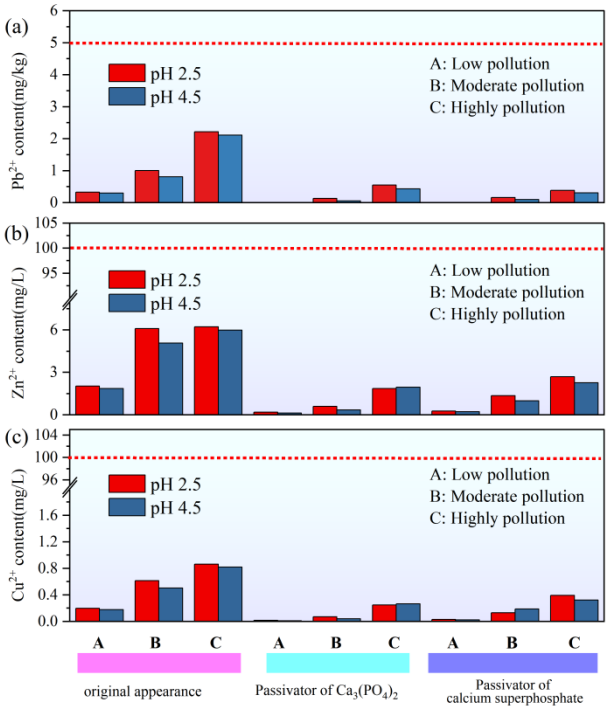

Fig. S2. Phosphorus-containing material passivation gangue dissolution experiment simulating acid rain; (a), (b) and (c) are the acid rain dissolution results for Pb^{2+}, Zn^{2+} and Cu^{2+}, respectively. A, B and C correspond to low-, moderate- and high-pollution coal gangue, respectively. The red line in the diagram indicates the concentration limit of each heavy metal in the standard GB/T34230-2017.

References

1. Zhang HL, Jiang XL, Zhao MF, Li TG. Passivation performance and mechanism of coal gangue with different pollution levels based on CaO and calcite. *Chin. Sci. Bull. (China)*. 2024;69:617–629. https://doi.org/10.1360/TB-2023-1051.