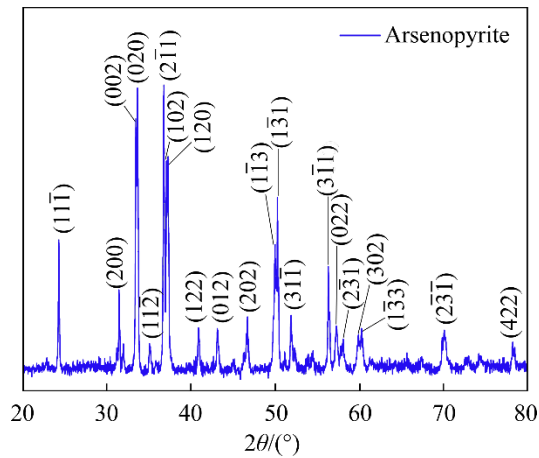
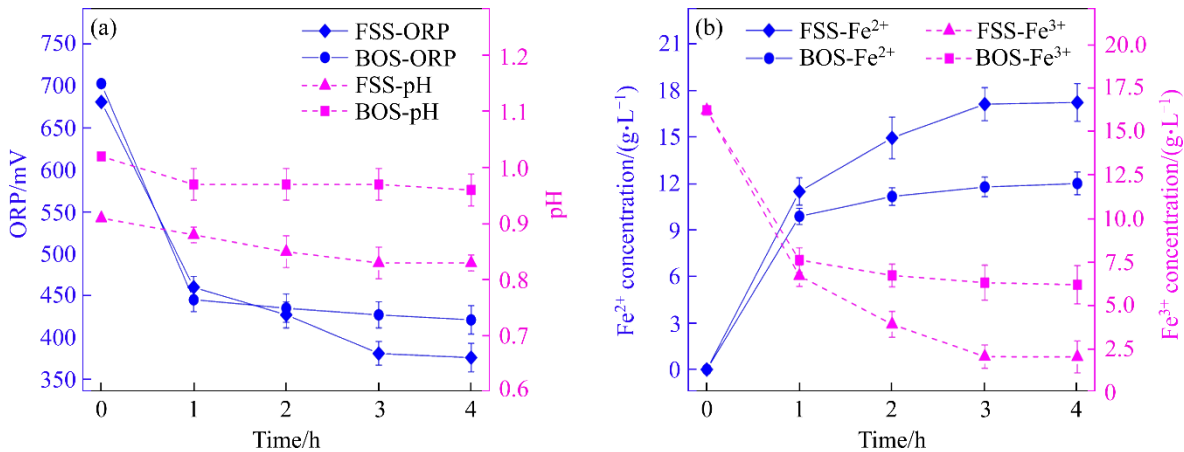


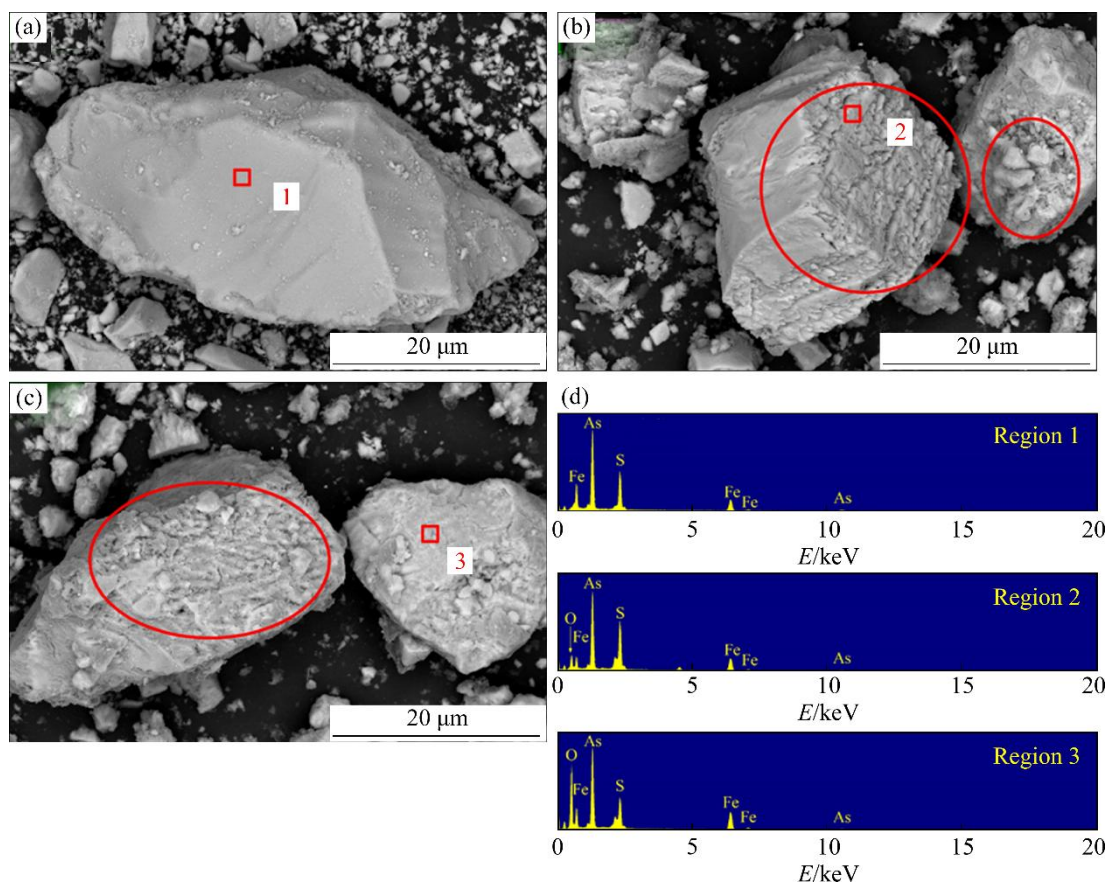
# Supplementary materials



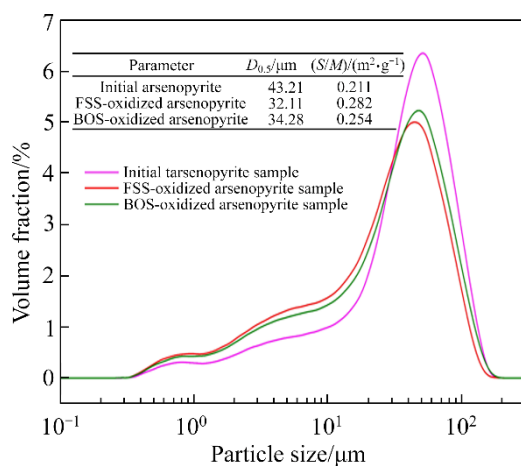
**Figure S1** X-ray diffraction result of arsenopyrite sample



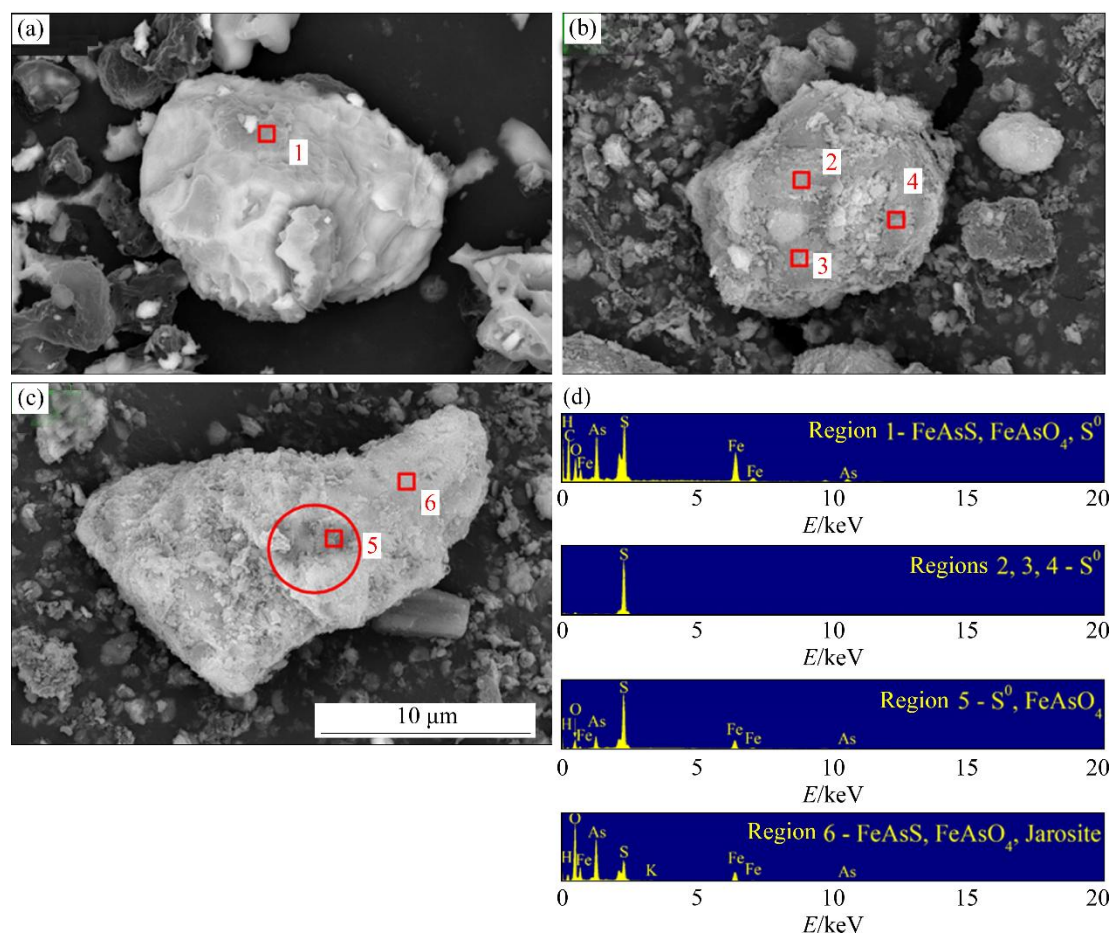
**Figure S2** The variations of the ORP-pH, FSS/BOS-ORP/pH (a), and ferrous-ferric iron concentration (FSS/BOS-Fe<sup>3+</sup>/Fe<sup>2+</sup>) (b) of FSS and BOS system during chemical oxidation



**Figure S3** SEM images of arsenopyrite before and after chemical oxidation in different systems: (a) Arsenopyrite; (b) FSS-oxidized arsenopyrite (FSS); (c) BOS-oxidized arsenopyrite; (d) EDS spectrum



**Figure S4** The particle size distribution of arsenopyrite samples before and after chemical oxidation in different systems ( $D_{0.5}$  is the size of particles that accounts for 50% of the total particle distribution;  $S/M$  is the specific surface area)



**Figure S5** The SEM-EDS analysis of the bio-oxidized residues: (a) Untreated arsenopyrite; (b) FSS-oxidized arsenopyrite; (c) BOS-oxidized arsenopyrite; (d) EDS spectrum