Electronic Supplementary Information

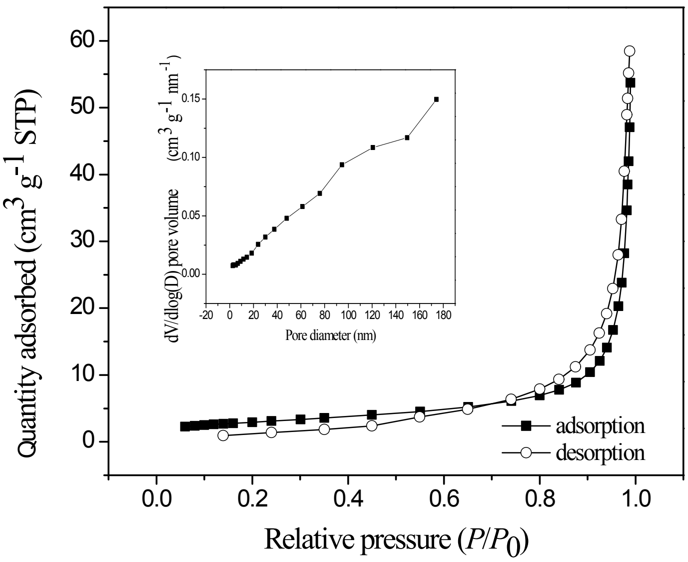

Fig. 1S Nitrogen adsorption-desorption isotherm and pore size distribution (inset) of Bt/Bc/α-Fe_2O_3

Figure 2S shows the FTIR spectra of Bt, rosin and Bt/Bc/α-Fe_2O_3 between 4000 and 400 cm^{-1}. The spectrum of Bt consisted of the bands at 3650, 3420, 1037, 790, 520 and 467 cm^{-1}. The band at 3650 cm^{-1} was O-H stretching vibrations of Si-OH groups. The broad band centered near 3420 cm^{-1} represented -OH vibration band of silicate skeleton. The peak at 1037 cm^{-1} corresponded to Si-O-Si groups of the tetrahedral sheets, and bands at 790, 520, and 467 cm^{-1} were due to the deformation and bending modes of the Si-O bond.[1] Some typical peaks of rosin at 3430, 2936 and 1697 cm^{-1} were assigned to O-H stretch in COOH, C-H stretch in pyranoid ring and C=O stretch in COOH, respectively.[2] After the pyrolysis reaction, the identical peaks of rosin at near 3430, 2936 and 1697 cm^{-1} got weak or even disappeared in Bt/Bc/α-Fe_2O_3 because of biochar generation from the pyrolysis of rosin at high temperature. The peaks of Bt had a similar result as rosin occurring in Bt/Bc/α-Fe_2O_3 due to the Bt being covered by biochar or α-Fe_2O_3. Moreover, the bands of Bt/Bc/α- Fe_2O_3 at 556 and 470 cm^{-1} could be attributed to the Fe-O stretching vibration in α-Fe_2O_3.[3, 4] Furthermore, the bands at 3393 and 1630 cm^{-1} in Bt/Bc/α-Fe_2O_3 could correspond the stretching vibration and bending vibration of surface OH groups in α-Fe_2O_3.[4] The FTIR results indicate the pyrolysis of rosin into biochar, Bt being coated as substrate, and the production of Fe_2O_3 during the preparation of Bt/Bc/α-Fe_2O_3.

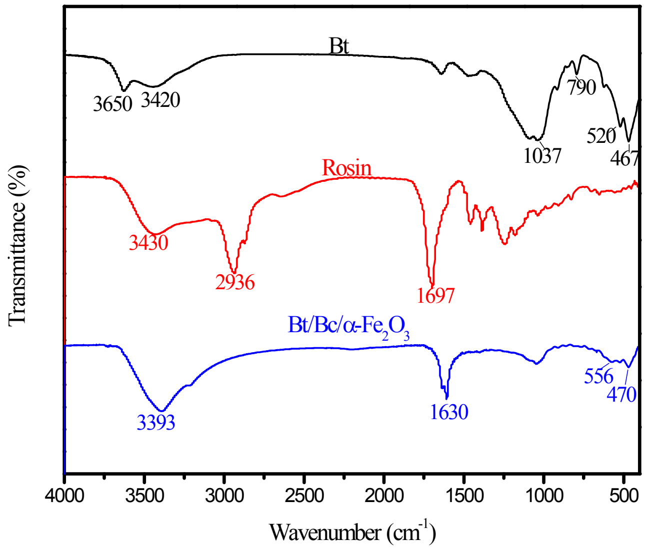

Fig. 2S FTIR spectra of Bt, rosin, and Bt/Bc/α-Fe_2O_3.

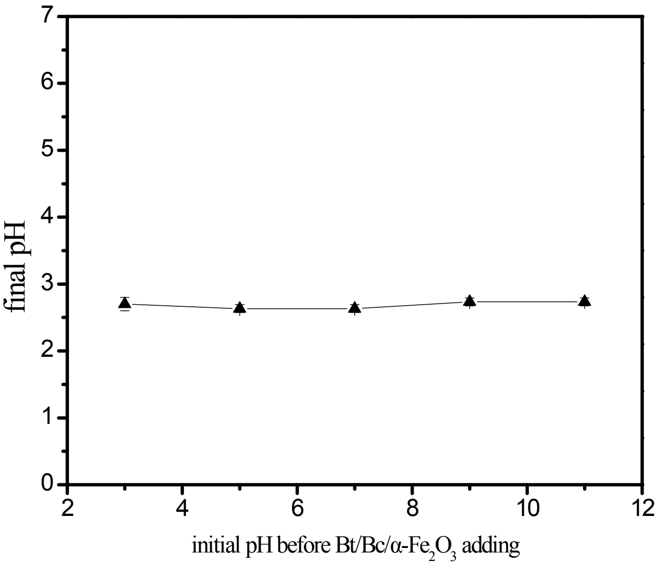

Fig. 3S Variation of Bt/Bc/α-Fe_2O_3 suspension pH after immersing into aqueous solution with different pH. (adsorbent dosage: 0.8 g L^{-1}, shaking speed: 100 rpm, contact time: 30 min, T: 25 ^oC)

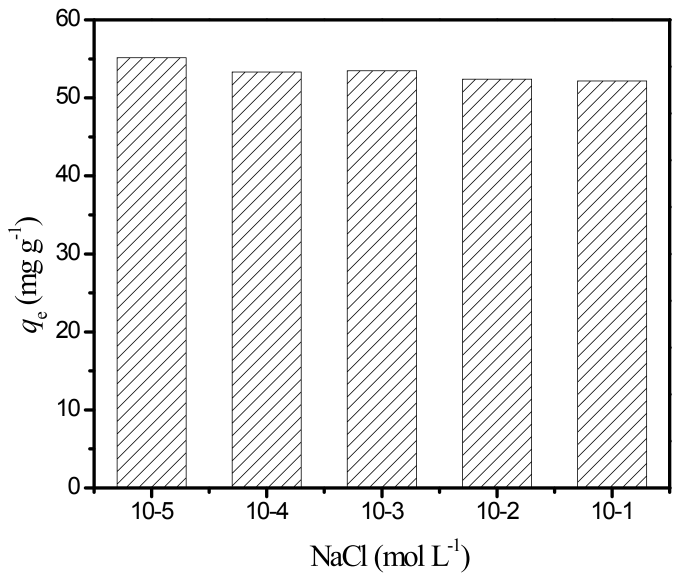

Fig. 4S Effect of Na^+ and Cl^{-1} on the removal of Cr (Ⅵ) by Bt/Bc/α-Fe_2O_3. (adsorbent dosage: 0.8 g L^{-1}, Cr(Ⅵ) concentration: 50 mg L^{-1}, shaking speed: 100 rpm, contact time: 30 min, T: 25 ^oC)

References

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