Construction of Activated Carbons-Supported B_3N_3 Doped Carbons as Metal-free Catalyst for Dehydrochlorination of 1,2-Dichloroethane to Produce Vinyl Chloride

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The FTIR spectra was shown in Figure S1 (a), the absorption bands at 3290 cm^{-1} and 2110 cm^{-1} are the C≡C-H and -Ph-C≡CH stretch vibrations, respectively. The band at 2180 cm^{-1} is the -B-C≡C-Ph- stretch vibration[1]. The typical absorption bands at 3430 cm^{-1} and 1459 cm^{-1} are assigned to the N-H and B-N stretching vibration, respectively. And an out-of-plane bending vibration at 684 cm^{-1} of B_3N_3 ring is also observed. The ^1H NMR spectra was shown in Figure S1 (b), the aromatic and ethynyl protons appear as multiple at 7.20-7.80 and 3.11 ppm[2], respectively. And the characteristic peak at 5.60 ppm was assigned to the NH- on B_3N_3.

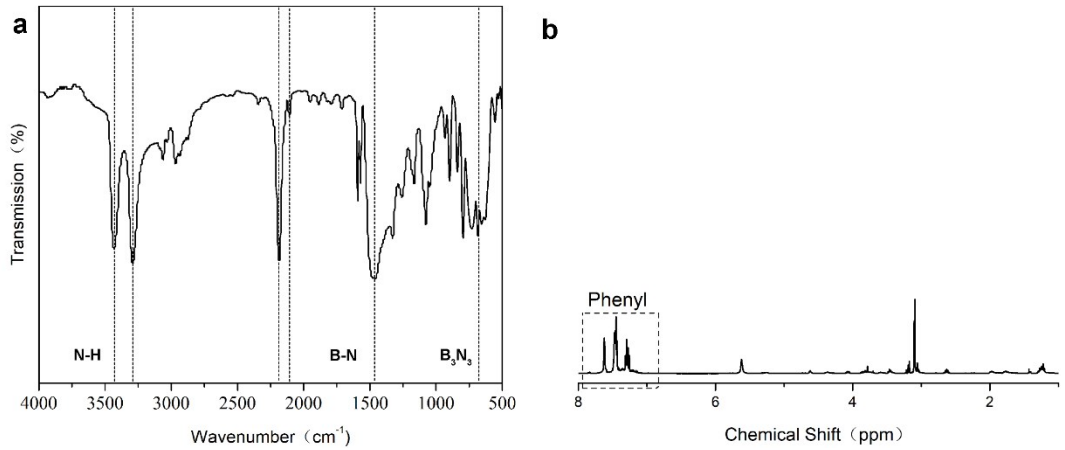

Figure S1. FTIR spectra (a) and ^1H NMR spectra of PBSZ.

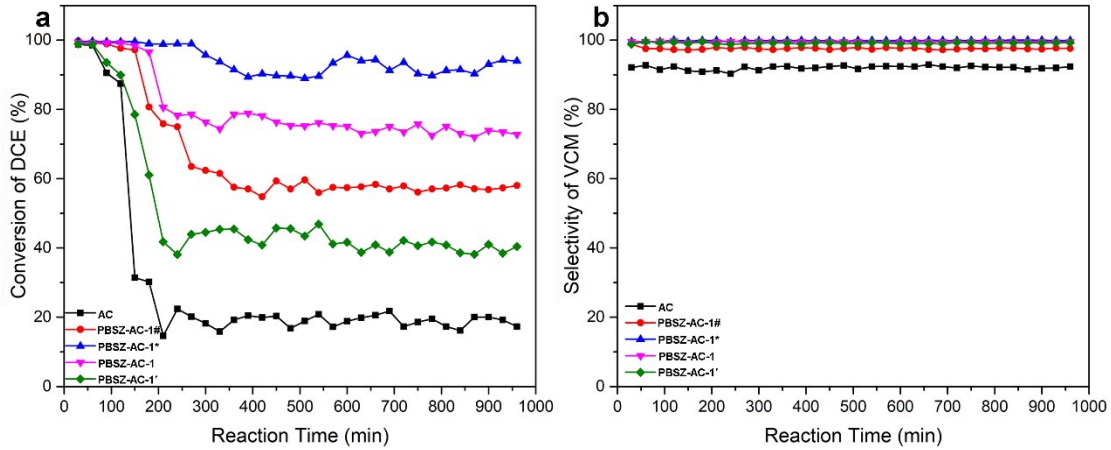

Figure S2. (a) the conversion of 1,2-DCE over the B, N-ACs catalysts; (b) the selectivity of VCM over the B, N-ACs catalysts. Reaction conditions: temperature= 250°C, 0.1 MPa, LHSV (1,2-DCE) = 0.67 h^{-1}.

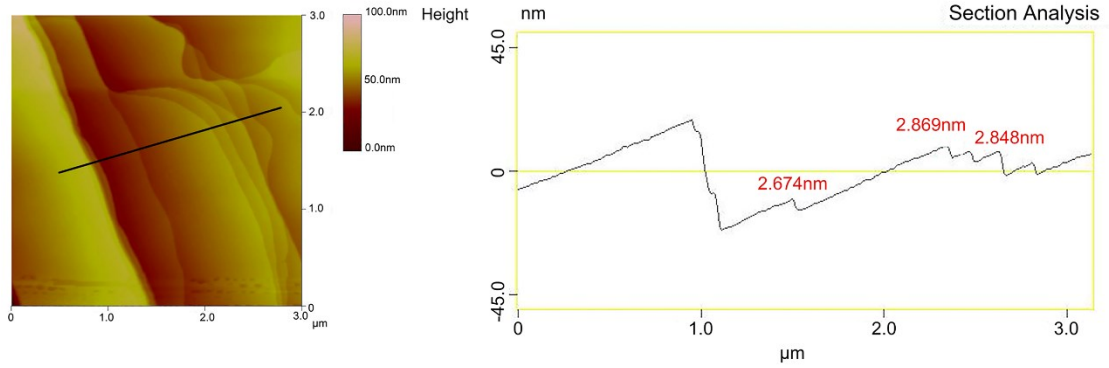

Figure S3. AFM images of PBSZ precursor after carbonized at 700°C.

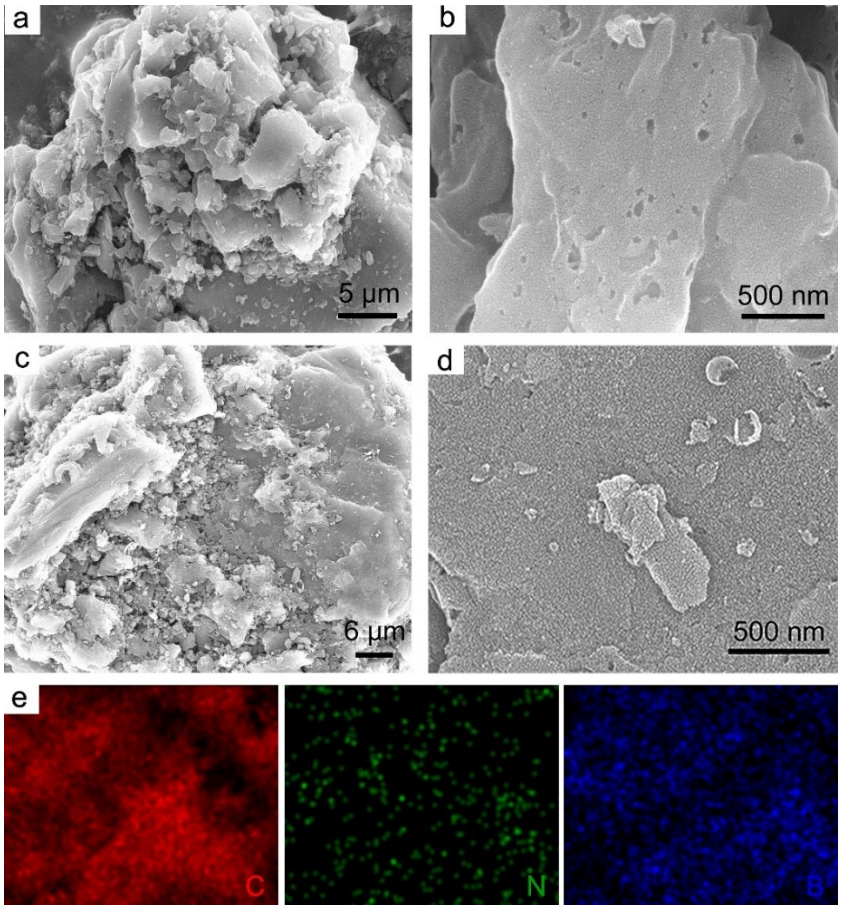

Figure S4. SEM micrograph of (a)(b) fresh PBSZ-AC-1 catalyst and (c)(d) used PBSZ-AC-1 catalyst; (e) elemental distribution mapping of C, N, B in fresh PBSZ-AC-1

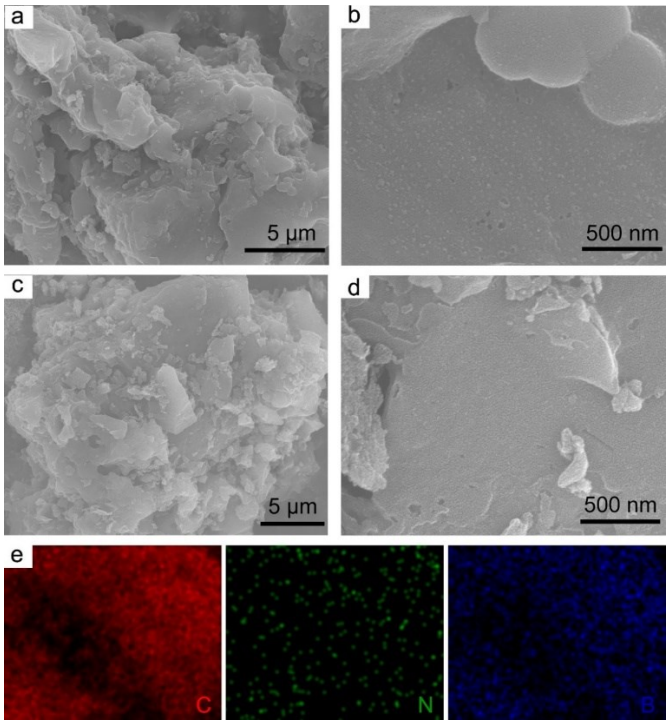

Figure S5. SEM micrograph of (a)(b) fresh PBSZ-AC-2 catalyst and (c)(d) used PBSZ-AC-2 catalyst; (e) elemental distribution mapping of C, N, B in fresh PBSZ-AC-2

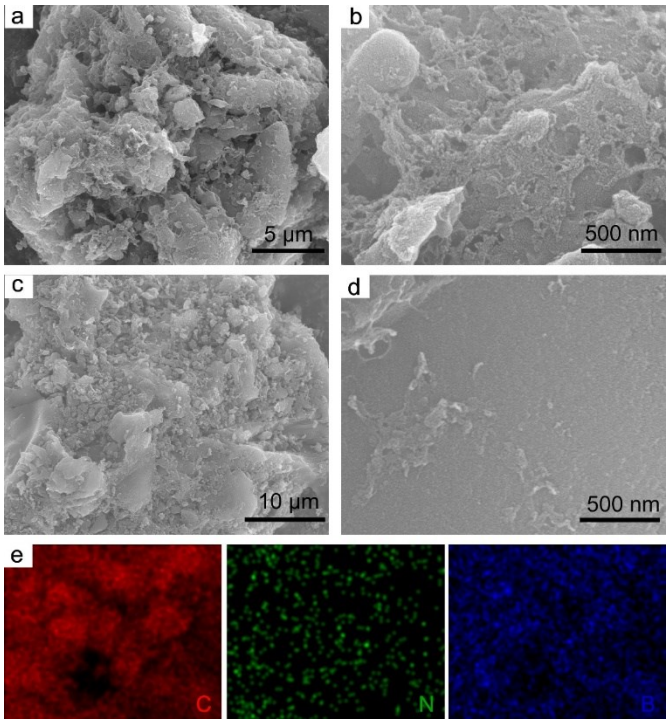

Figure S6. SEM micrograph of (a)(c) fresh PBSZ-AC-3 catalyst and (b)(d) used PBSZ-AC-3 catalyst; (e) elemental distribution mapping of C, N, B in fresh PBSZ-AC-3

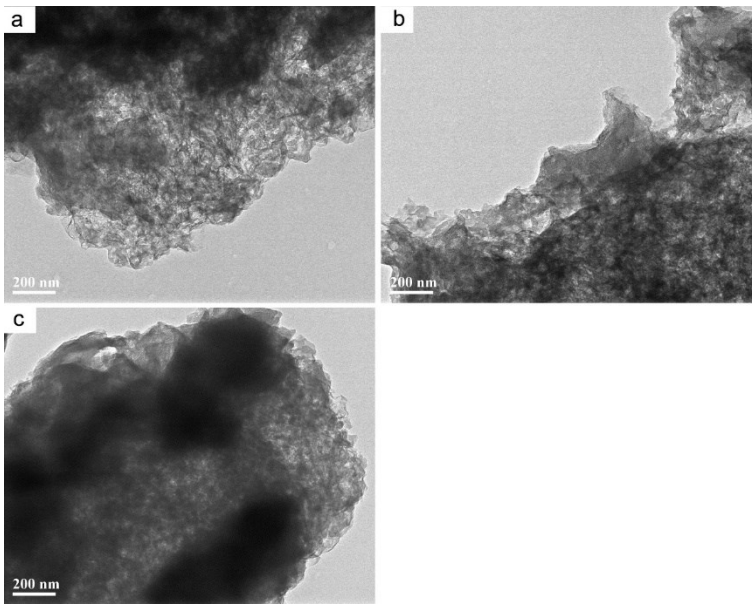

Figure S7. TEM images of (a) PBSZ-AC-1, (b) PBSZ-AC-2 and (c) PBSZ-AC-3 catalyst.

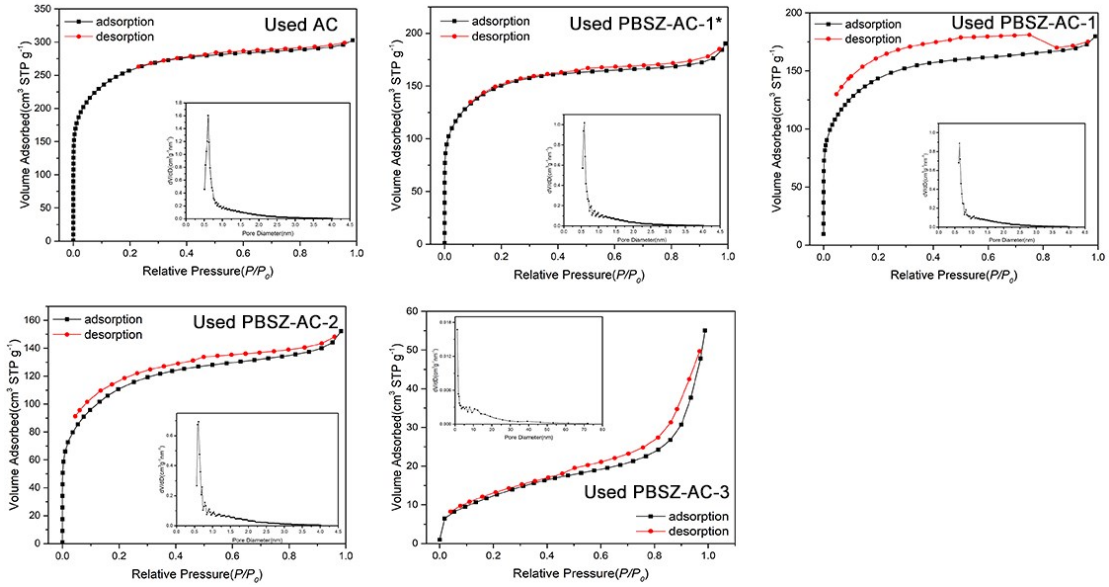

Figure S8. N_2 sorption isotherm and pore size distributions of the used B, N-ACs

1. W. E. Davidsohn and M. C. Henry, *Chem. Rev.*, 1967, **67**, 73-106.
2. F. Gao, L. Zhang, Y. Zhou, F. Huang and L. Du, *Journal of Macromolecular Science, Part A*, 2010, **47**, 861-866.