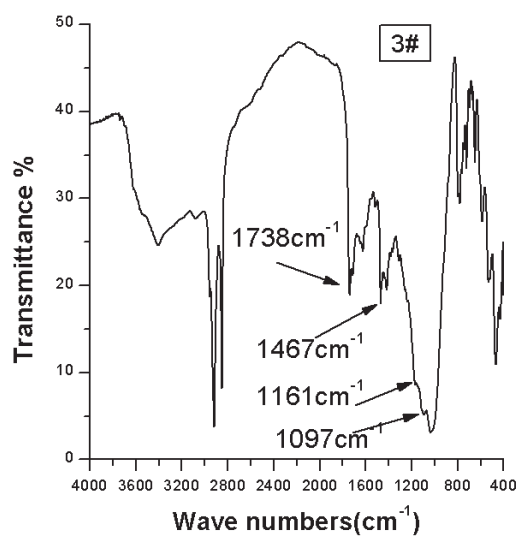
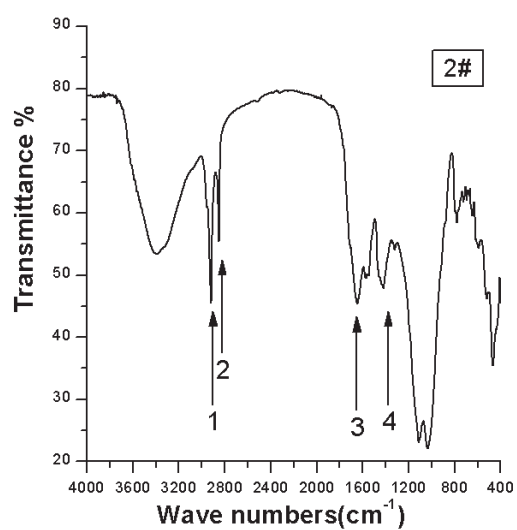
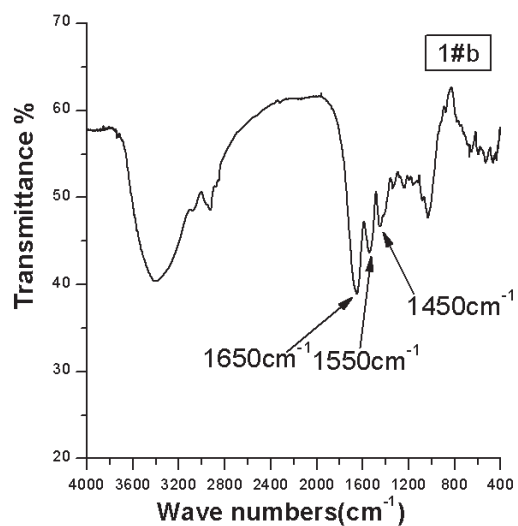
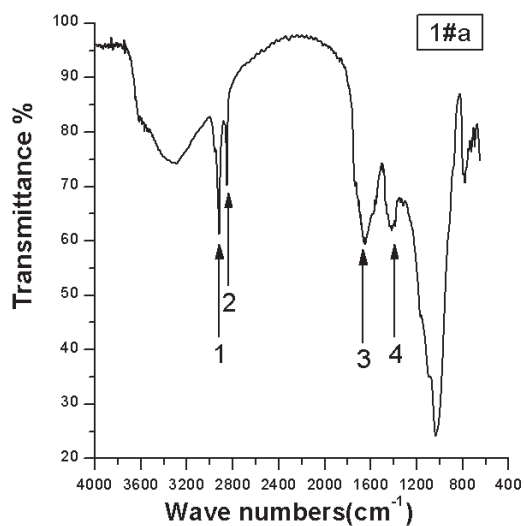
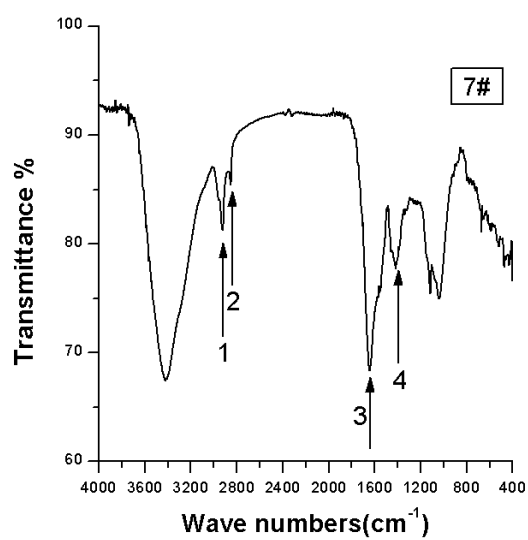
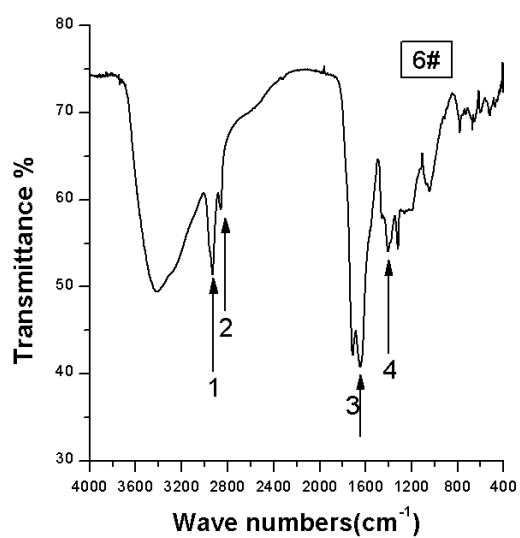
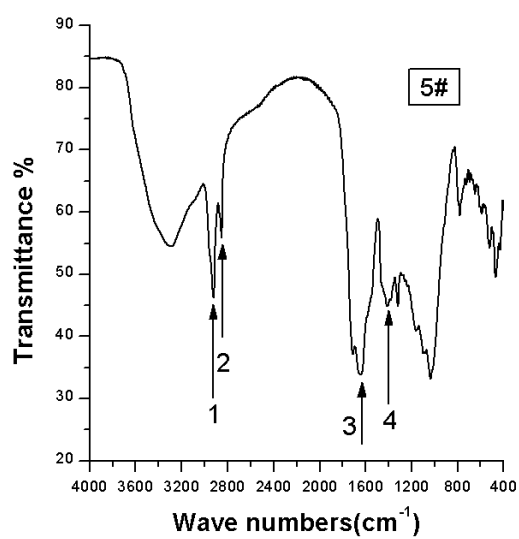
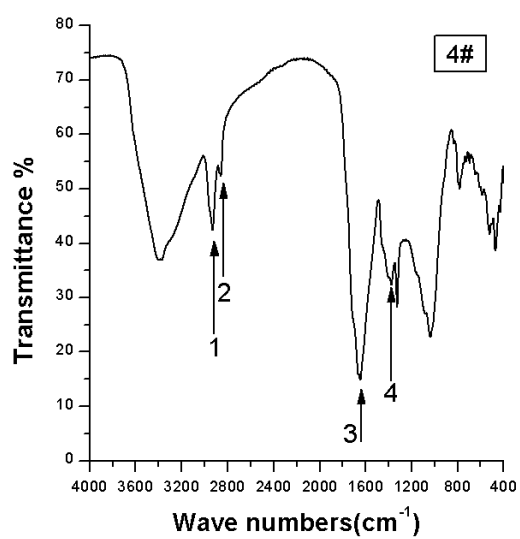
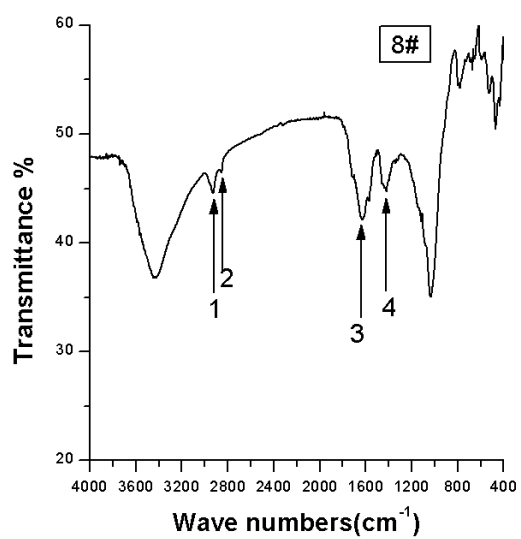


Supplementary Figure 6S. FTIR analysis of Astana residues.

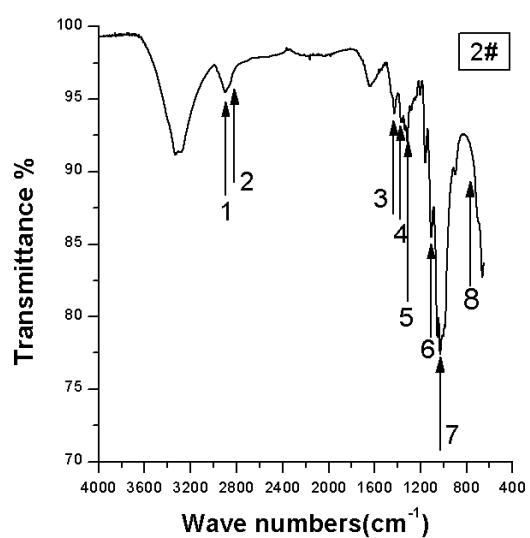
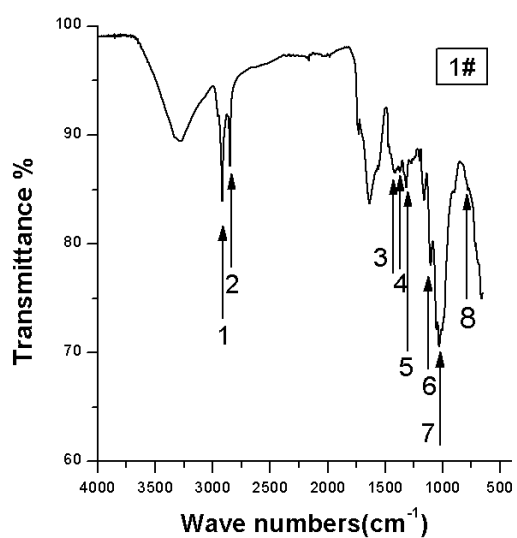
A. Ancient fuels

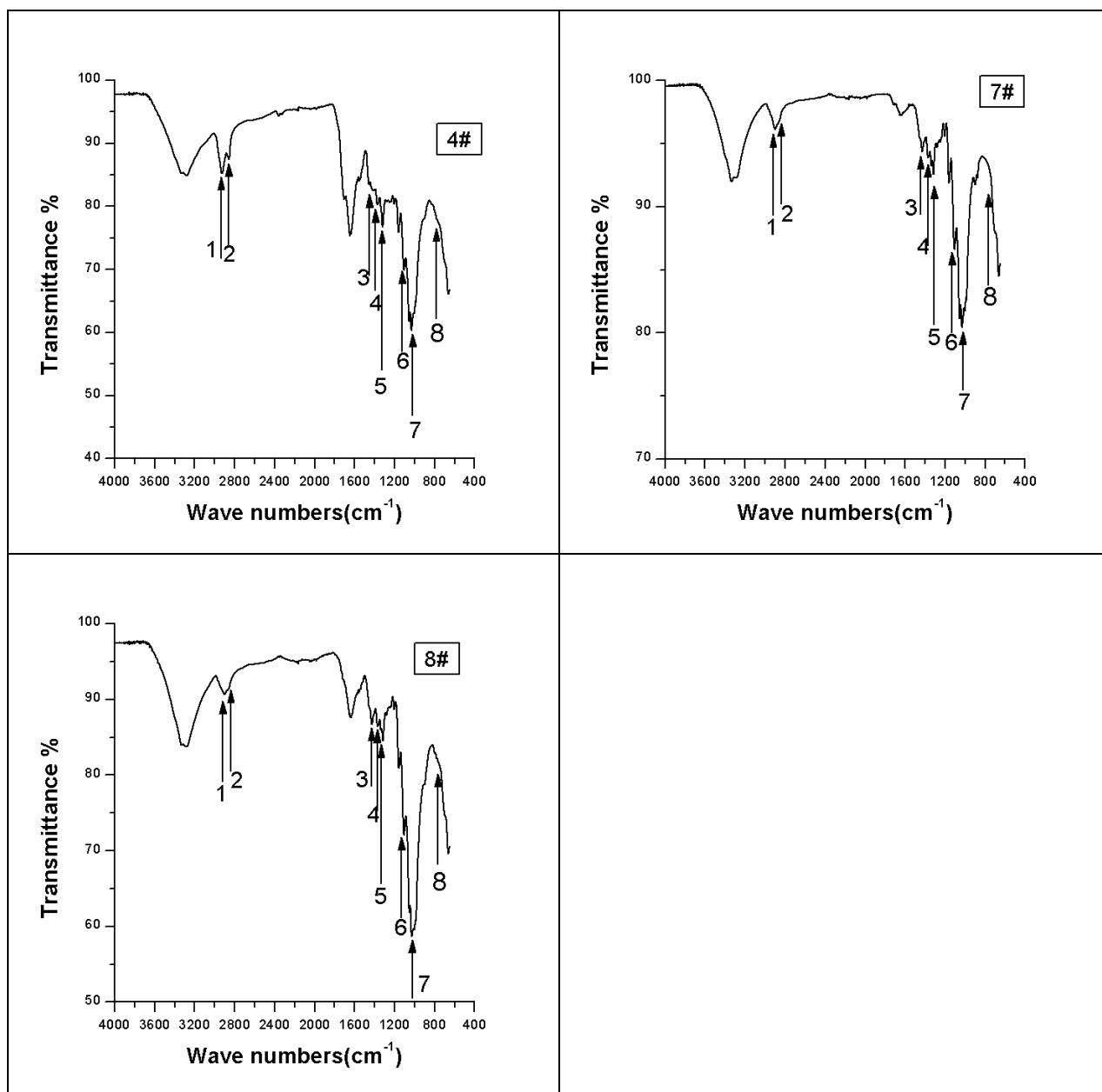






B. Ancient wick fibers





A: Ancient fuels. Spectrum of sample 1#b shows protein-characteristic amid signals: amide I band at 1650 cm^{-1} , amide II band at 1550 cm^{-1} and amide III band at 1450 cm^{-1} .

Spectrum of sample 3# shows fat-typical signals at 1738 cm^{-1} , 1467 cm^{-1} , 1161 cm^{-1} and 1097 cm^{-1} corresponding respectively to ester group in triacylglycerol, bending vibrations of the CH₂ and CH₃ aliphatic groups, stretching vibrations of the C-O group in esters and C-H bending vibrations of fatty acids. Spectra of samples 1#a, 4#, 5# and 6# look similar and present signals typical for organic material burnt to different degree (Oudemans, Boon et al. 2007).

B: Ancient wick fibers. All Astana wick fibers show characteristic cellulose peaks at 2920, 2851, 1417, 1370, 1317, 1115, 1037 and 779 cm^{-1} (Liu 2010).