Supporting Information

Title: Green Preparation of Tuneable Carbon-Silica Composite Materials from Wastes

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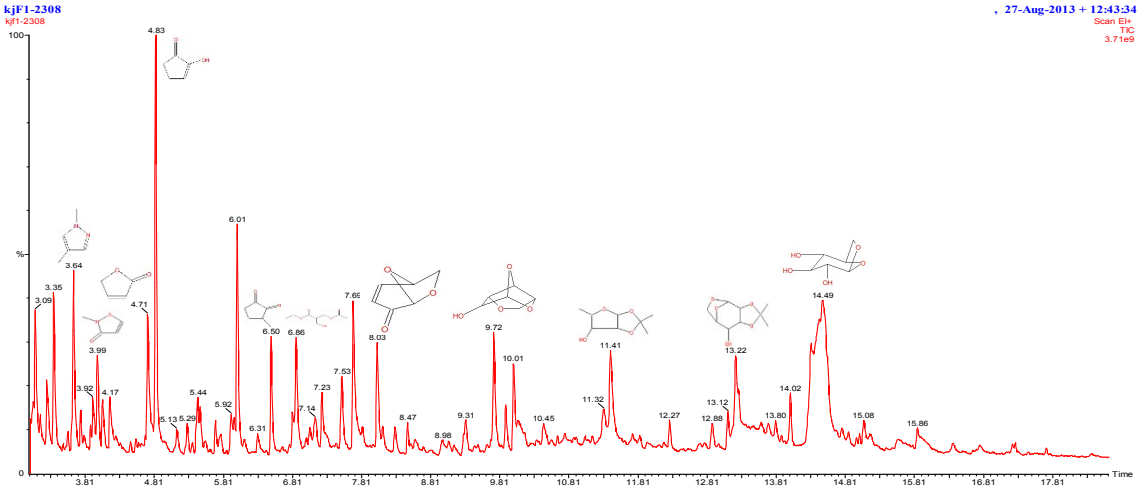

Fig. S1 GC spectrum of bio-oil carbonized from waste paper

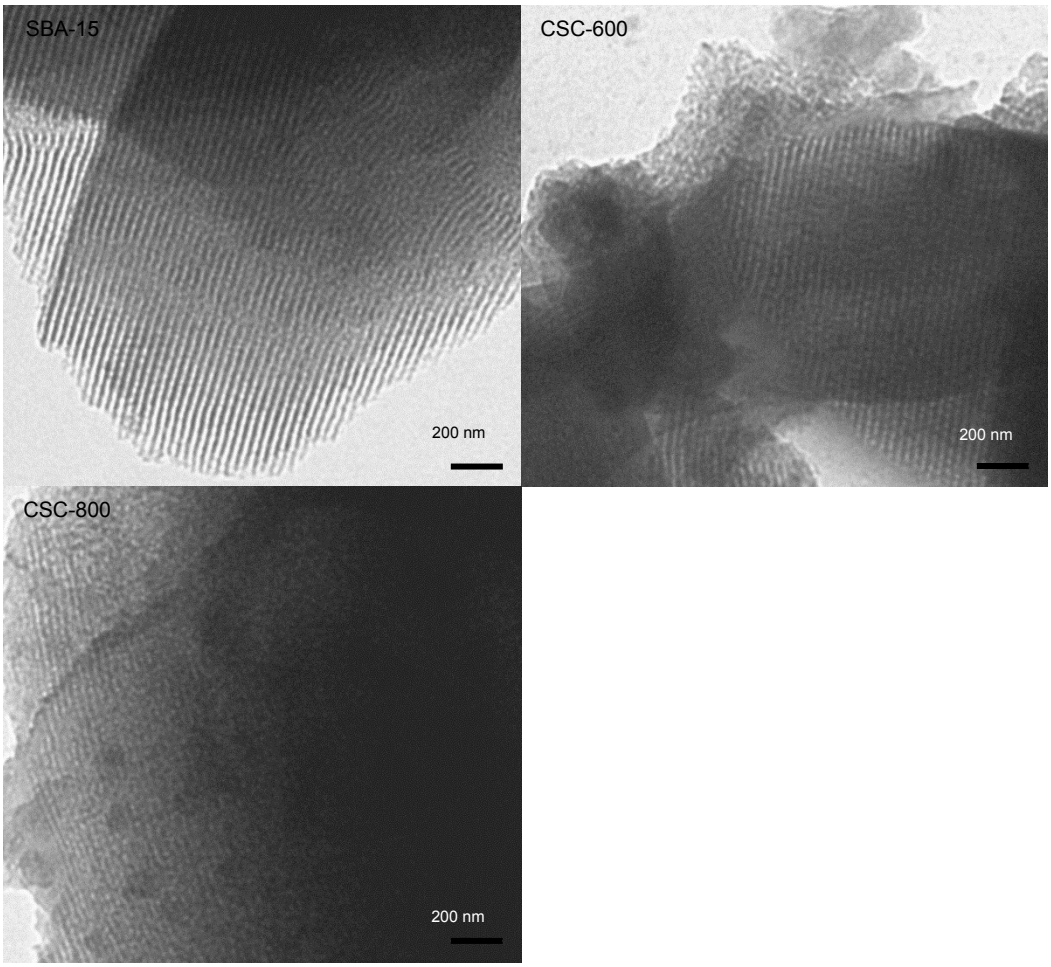

Fig. S2 Magnified TEM images of SBA-15, CSC-600 and CSC-800 samples

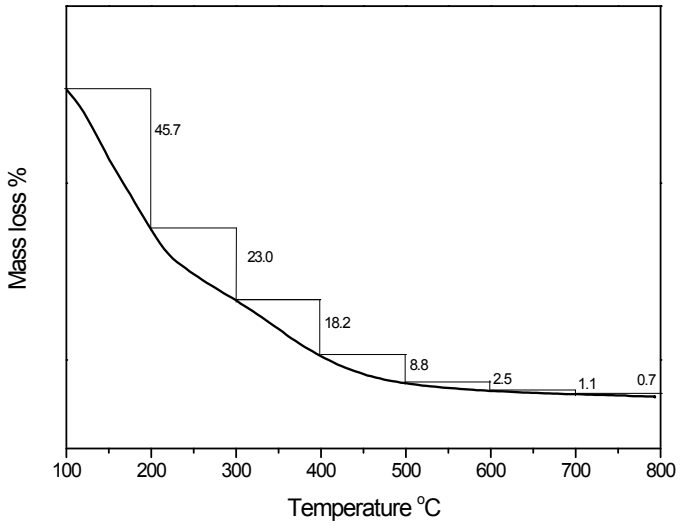

Fig. S3 Thermogravimetric analysis of CSC-800 sample

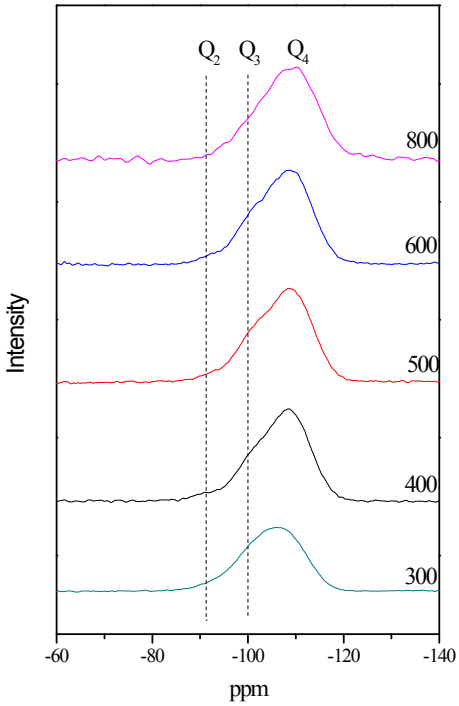

Fig. S4 ^{29}Si solid state NMR spectra of carbon-silica composites prepared at 300 °C, 400 °C, 500 °C, 600 °C and 800 °C

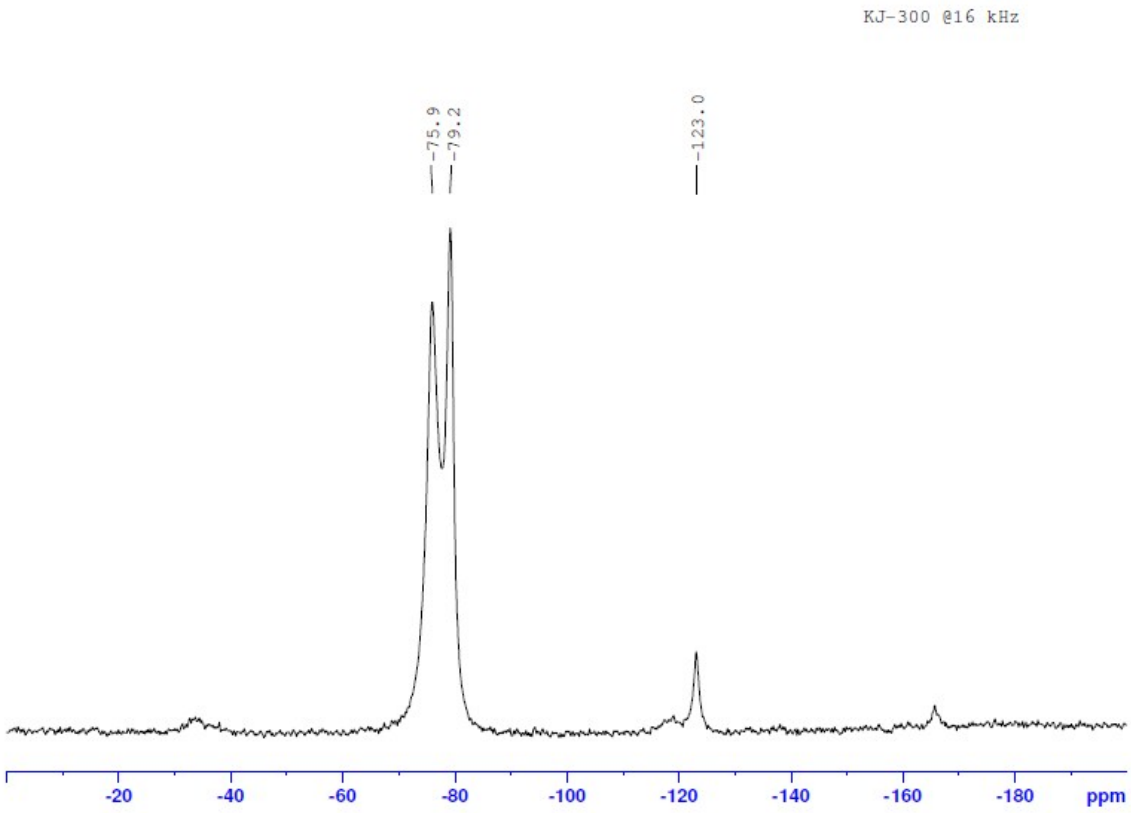

Fig. S5 ^{19}F solid state NMR spectra of CSC-300

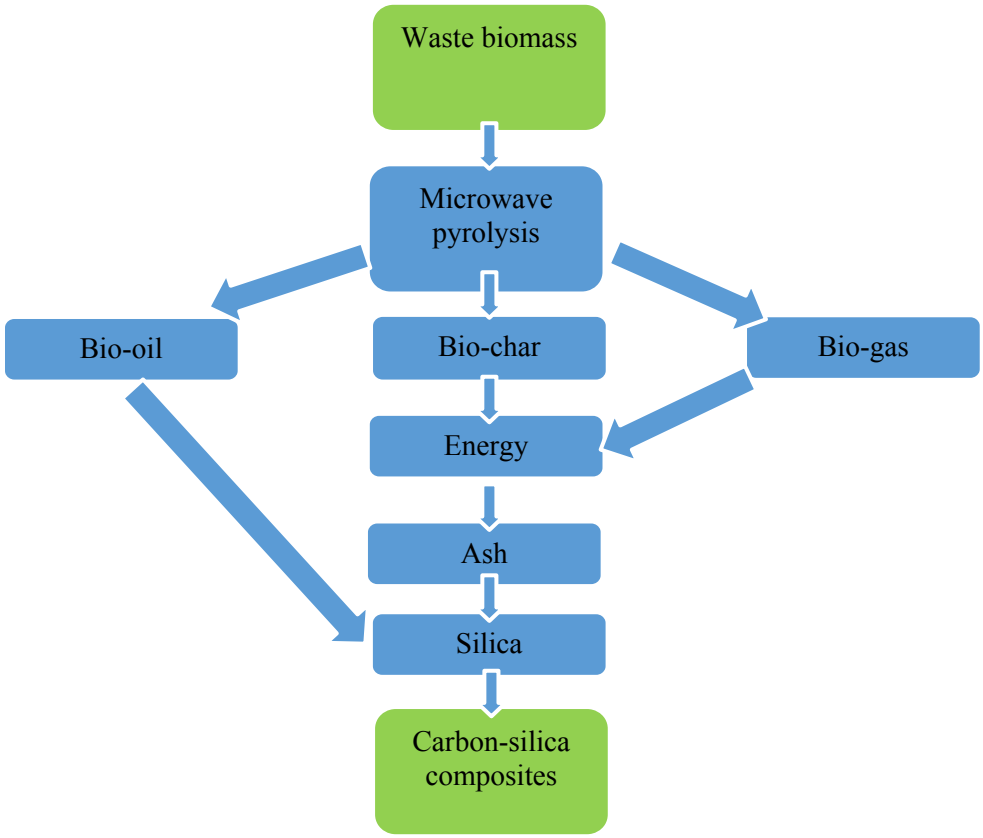

Fig. S6 Flow graph of fabrication of carbon-silica composites from waste biomass

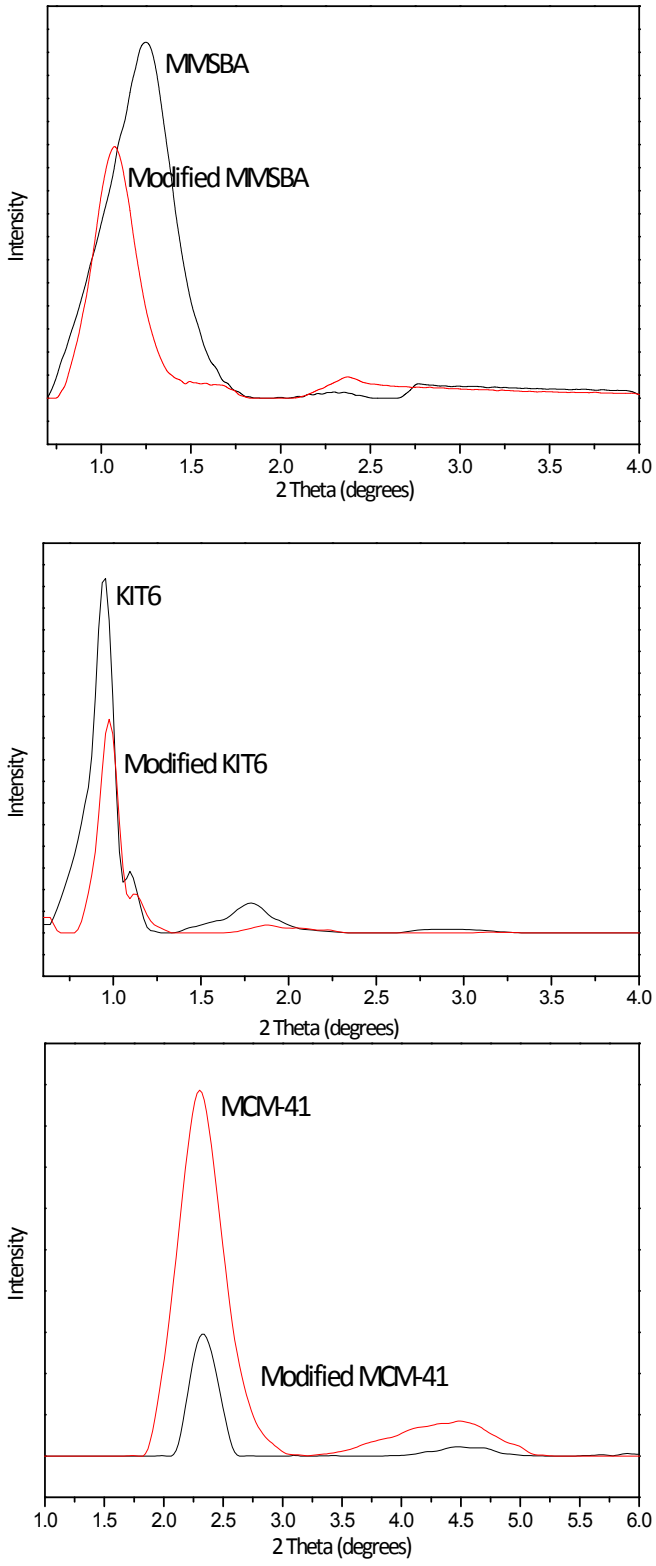

Fig. S7 XRD patterns of parent MMSBA, KIT-6, MCM-41and corresponding modified CSCs

Table S1. Textural properties of parent SBA-15 samples and CSC materials prepared from different bio-oil/SBA ratios characterized by N_2 Adsorption

	Ratio of bio-oil/SBA	BET surface area [m^2 g^{-1}]	Pore volume [cm^3 g^{-1}]	Pore diameter [nm]
SBA-15	/	795	0.80	4.04
25 mg	0.25	672	0.68	4.02
50 mg	0.5	656	0.62	3.78
100 mg	1	608	0.51	3.33
200 mg	2	517	0.37	2.85
400 mg	4	475	0.30	2.50
800 mg	8	28	/	/

Table S2. Textural properties of parent SBA-15 samples and CSC materials prepared at different temperatures characterized by N_2 Adsorption

Sample	BET surface area [m^2 g^{-1}]	t-plot micropore area [m^2 g^{-1}]	Pore volume [cm^3 g^{-1}]	Pore diameter [nm]
SBA-15	732	186	0.80	5.10
300	39	36	0.03	/
400	449	206	0.19	3.28
500	636	290	0.31	3.47
600	457	201	0.24	3.46
800	411	164	0.23	3.42

Table S3. Textural properties of the parent silica substrates and the corresponding CSCs

Sample	BET surface area [m^2 g^{-1}]	t-plot micropore area [m^2 g^{-1}]	Pore volume [cm^3 g^{-1}]	Pore diameter [nm]
MMSBA	256	23	0.28	4.53
CSC-MMSBA	283	123	0.20	3.87
KIT-6	842	90	0.98	6.3
CSC-KIT-6	563	182	0.36	4.6
MCM-41	1024	0	0.99	3.2
CSC-MCM-41	743	112	0.23	2.6
SBA-15	732	186	0.80	5.10
CSC-SBA-15	636	290	0.31	3.47