Supplementary Material

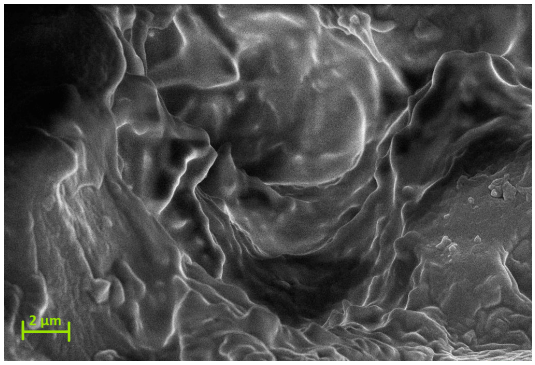
The Influence of Biowaste Type on the Physicochemical and Sorptive Characteristics of Corresponding Biochar Used as Sustainable Sorbent

Nikolaos Mourgkogiannis, Ioannis Nikolopoulos, Eleana Kordouli *, Alexis Lycourghiotis, Christos Kordulis and Hrissi K. Karapanagioti *

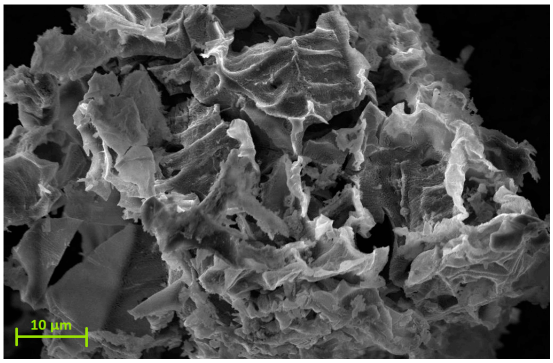
Department of Chemistry, University of Patras, GR-26504 Patras, Greece; nikosmorgan@hotmail.com (N.M.); gs.nikol@gmail.com (I.N.); alycour@upatras.gr (A.L.); kordulis@upatras.gr (C.K.)
* Correspondence: ekordouli@upatras.gr (E.K.); karapanagioti@upatras.gr (H.K.K.)

Table S1. EDS elemental analysis of the materials studied.

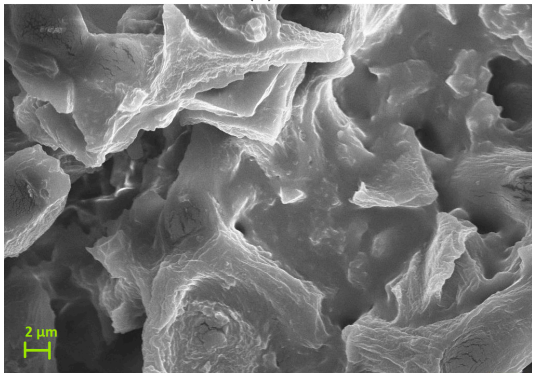
Samples	C	O	N	Si	K	Ca	Mg
SCG	61	30	7.35	-	1	0.5	0.15
SCG-B	67	22	8.2	-	1.6	1	0.2
SGC	60.5	32	7	-	0.3	0.05	0.15
SGC-B	68	23.7	7.5	-	0.5	0.1	0.18
GSW	66	33	-	-	0.35	0.6	0.05
GSW-B	70	28.7	-	0.05	0.45	0.65	0.15
GST	65	34	-	-	0.65	0.35	0.1
GST-B	71	27	-	0.2	1	0.7	0.1
RH	40	31	-	28	1	-	-
RH-B	45	21	-	32	1.2	0.1	0.7



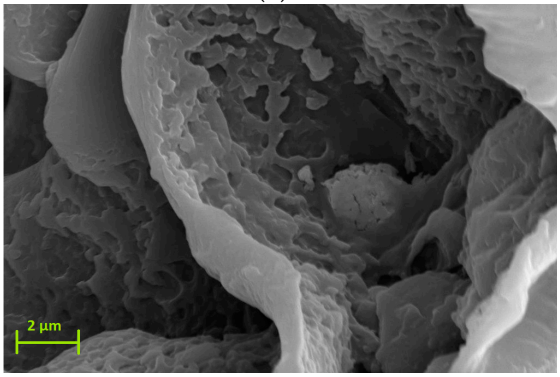
(a)



(b)



(c)



(d)

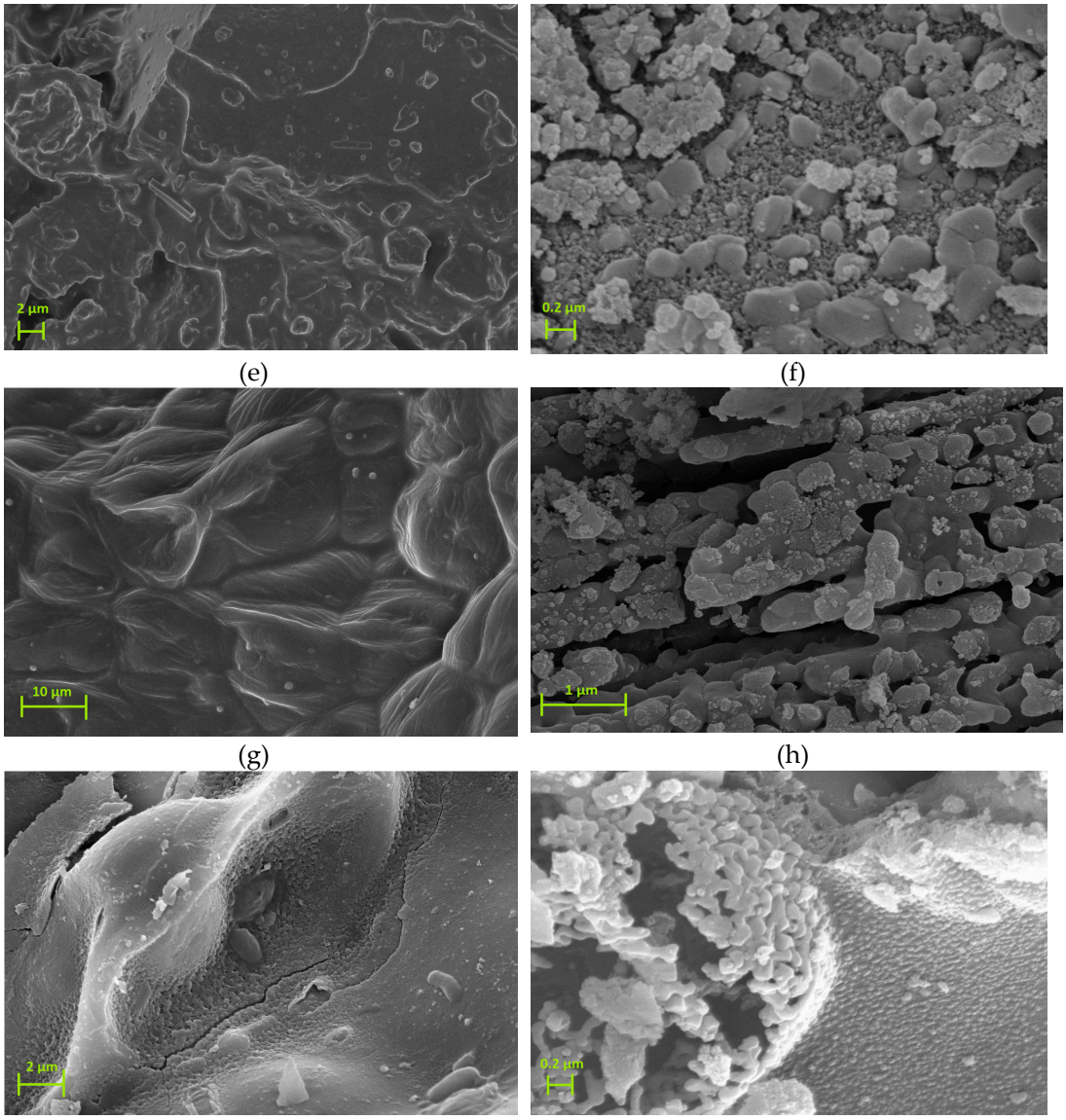
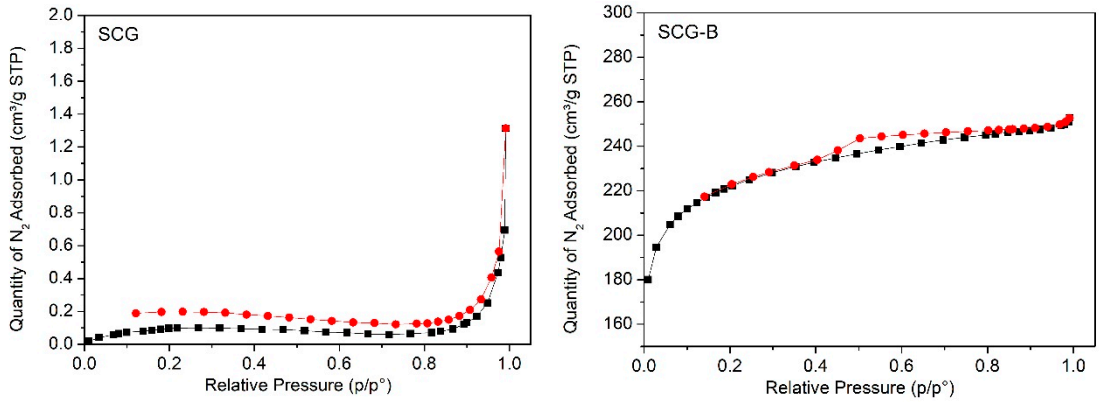
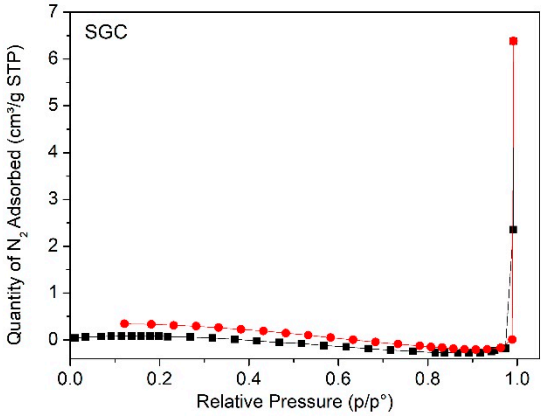
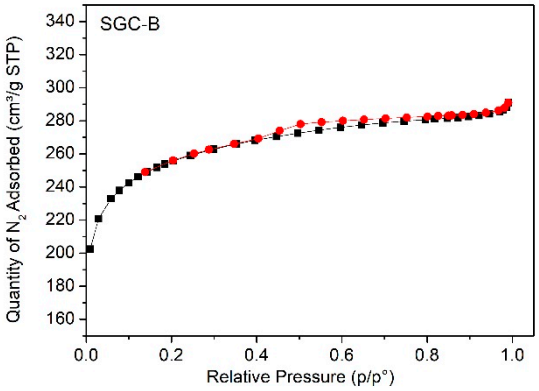
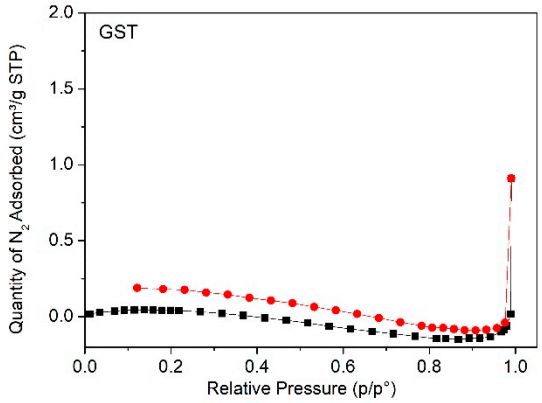


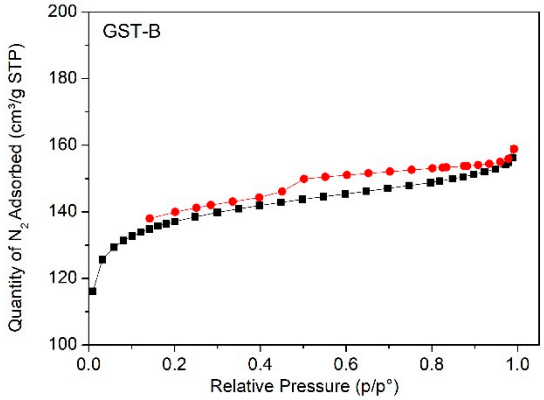
Figure S1. SEM micrographs of raw materials and biochar samples obtained. (a) SCG, (b) SCG-B, (c) SGC, (d) SGC-B (e) GSW, (f) GSW-B, (g) GST, (h) GST-B, (i) RH, and (j) RH-B.

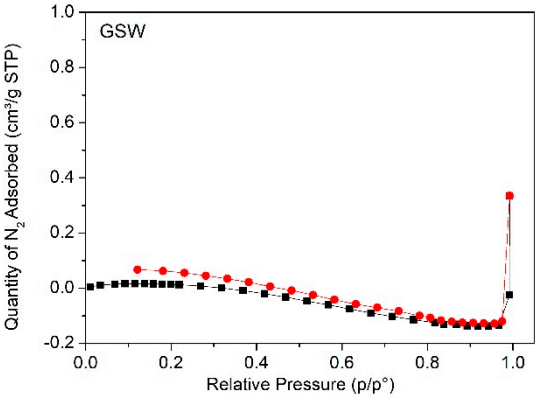


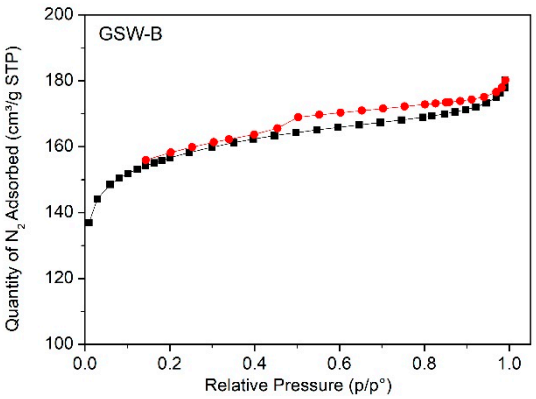

SGC
Quantity of N2 Adsorbed (cm3/g STP)
Relative Pressure (p/p°)

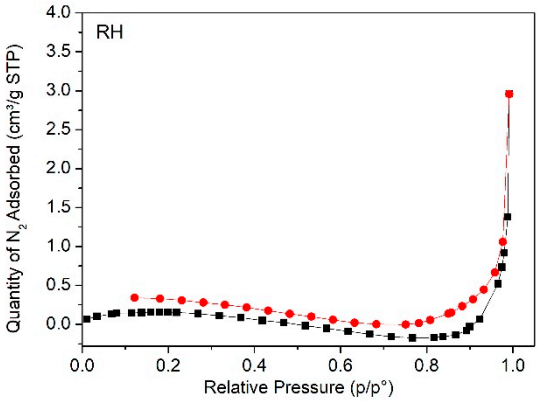

SGC-B
Quantity of N2 Adsorbed (cm3/g STP)
Relative Pressure (p/p°)


GST
Quantity of N2 Adsorbed (cm3/g STP)
Relative Pressure (p/p°)


GST-B
Quantity of N2 Adsorbed (cm3/g STP)
Relative Pressure (p/p°)


GSW
Quantity of N2 Adsorbed (cm3/g STP)
Relative Pressure (p/p°)


GSW-B
Quantity of N2 Adsorbed (cm3/g STP)
Relative Pressure (p/p°)


RH
Quantity of N2 Adsorbed (cm3/g STP)
Relative Pressure (p/p°)

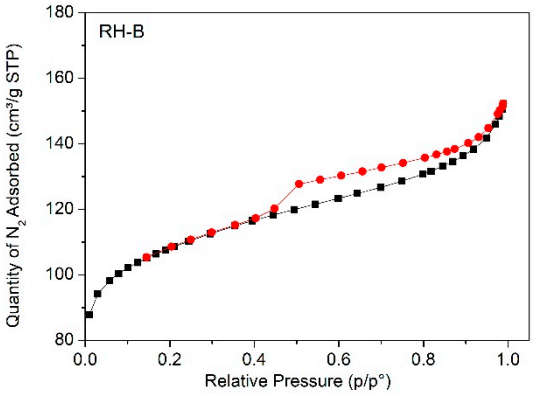

RH-B
Quantity of N2 Adsorbed (cm3/g STP)
Relative Pressure (p/p°)

Figure S2. N_2 adsorption-desorption isotherms recorded at liquid nitrogen temperature of raw materials and biochar samples obtained.

Figure S2 (left) shows the adsorption-desorption isotherms of biowaste materials. These isotherms belongs to Type III isotherm according to IUPAC classification, indicating a nonporous or macroporous solid. Figure S2 (right) shows the adsorption-desorption isotherms of biochar samples. These isotherms is a mixing of Type I and Type IV isotherms of IUPAC classification with Type H4 hysterisis loop. These isotherms are characteristic for microporous solids, like active carbon and zeolites having also a significant fraction of mesoporous (pore diameter in the range 2 -50 nm) [58].

[58] M. Thommes*, K. Kaneko, A. V. Neimark, J. P. Olivier, F. Rodriguez-Reinoso, J. Rouquerol, K. S.W. Sing. Physisorption of gases, with special reference to the evaluation of surface area and pore size distribution (IUPAC Technical Report), Pure Appl. Chem. 2015; DOI 10.1515/pac-2014-1117