Electronic Supplementary Information (ESI)

Template-Free Synthesis of Monolithic Carbon Xerogels with Hierarchical Porosity from Resorcinol and Formaldehyde via Hydrothermal Reaction

G. Cho, J. Y. Lee and T. H. Yoon*

School of Materials Science and Engineering, Gwangju Institute of Science and Engineering, Gwangju, 61005, South Korea.

* To whom correspondence should be addressed (thyoon@gist.ac.kr, Fax: +82-62-715-2304, Tel:+82-62-715-2307)

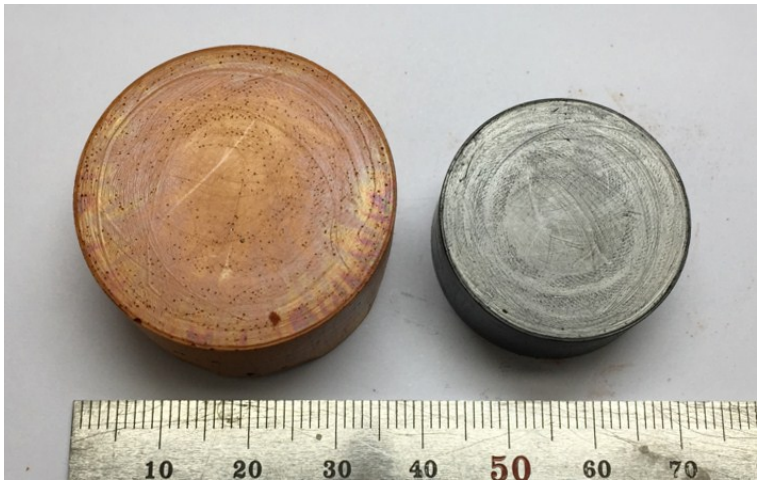

Fig. S1. Photo of monolithic RF (left) and carbon (right) xerogels.

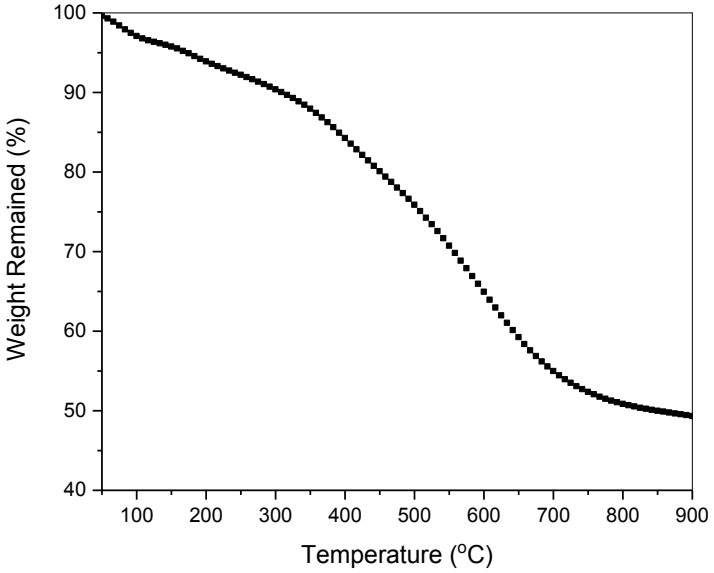

Fig. S2. TGA of monolithic carbon xerogel of 45-10k under N_2 flow at 10°C/min.

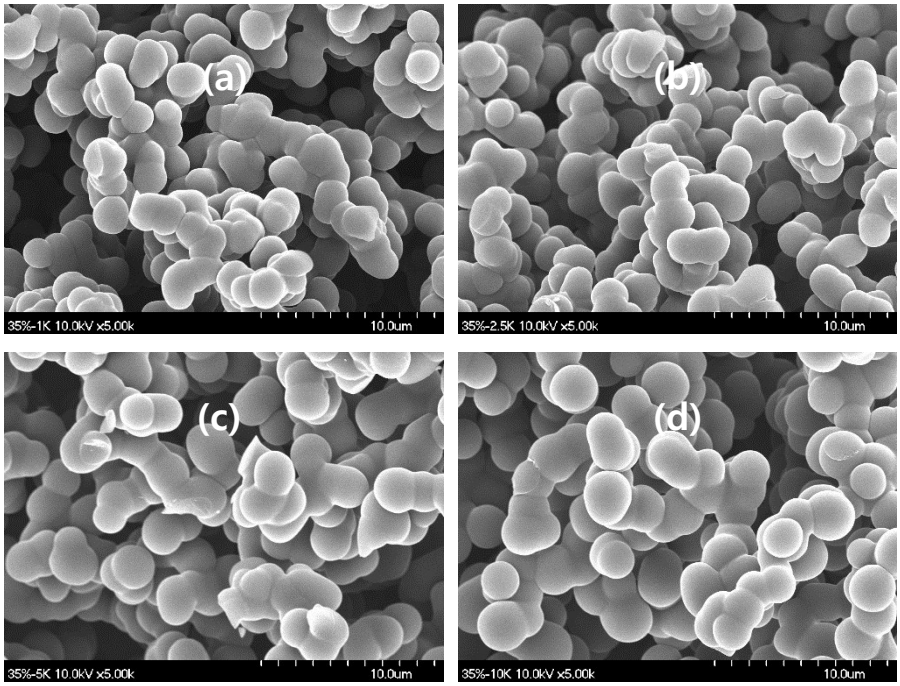

Fig. S3. SEM micrographs from monolithic carbon xerogels of a) 35-1k, b) 35-2.5k, c) 35-5k, and d) 35-10k.

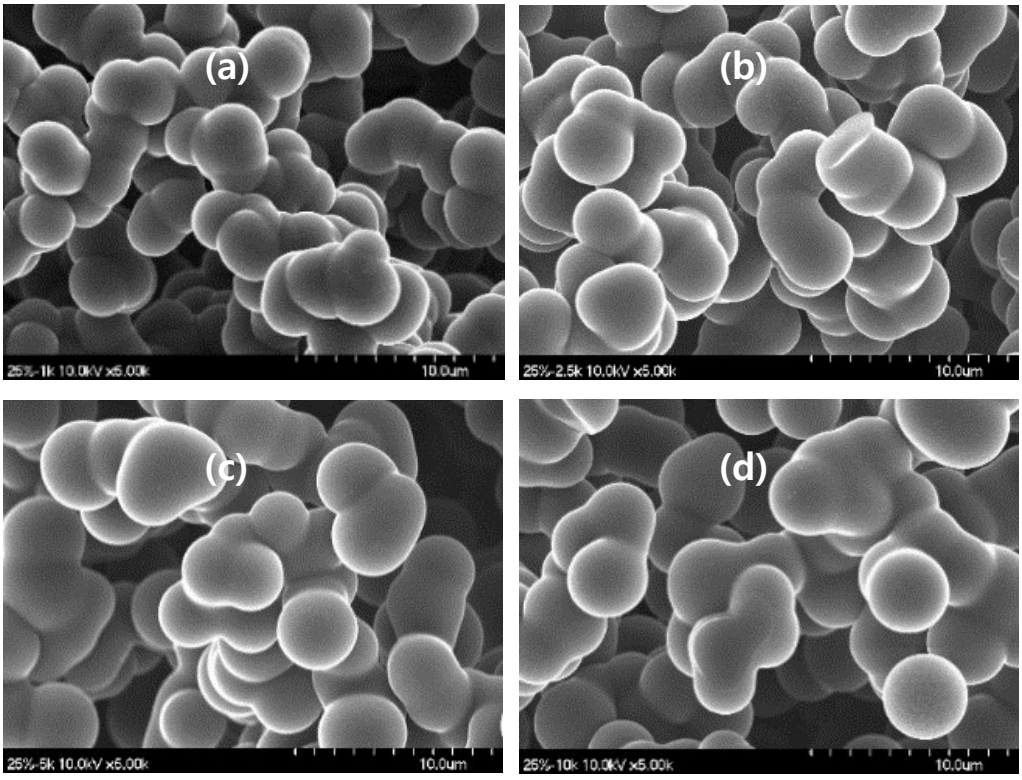

Fig. S4. SEM micrographs from monolithic carbon xerogels of a) 25-1k, b) 25-2.5k, c) 25-5k, and d) 25-10k.

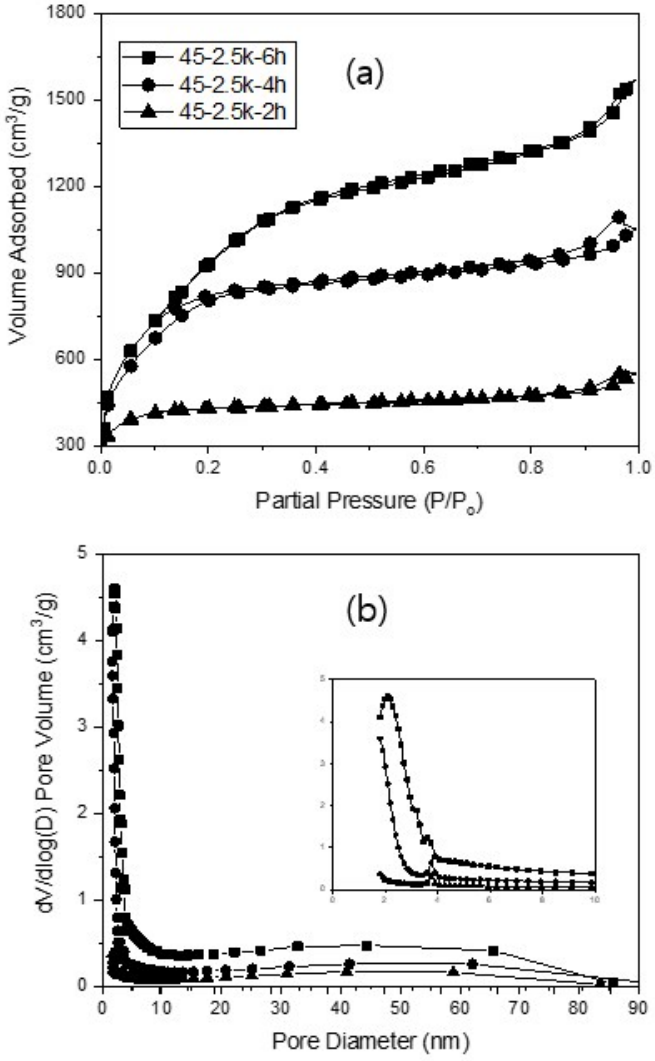

Fig. S5. Nitrogen isotherms (a) and pore size distribution (b) of monolithic carbon xerogels of 45-2.5k upon 2, 4, or 6 h activation.

Table S1. Burn off ratio (%) of monolithic carbon xerogels from R/W=45 upon activation.

	1k	2.5k	5k	10k
2h	37	33	31	31
4h	61	58	57	56
6h	100	88	83	81

Table S2. Crack generation of monolithic carbon xerogels from R/W=45 upon activation.

	1k	2.5k	5k	10k
2h	SC	NC	NC	NC
4h	LC	SC	NC	NC
6h	NA	LC	SC	NC

NA: not applicable, NC: no crack, SC: small crack, LC: large crack

Table S3. Characteristics of monolithic carbon xerogels of 45-2.5k upon activation

Sample	S^a ($m^2\ g^{-1}$)	$V_{total}{}^b$ ($cm^3\ g^{-1}$)	$V_{micro}{}^c$($cm^3\ g^{-1}$)	$D_p{}^d$ (nm)
45-2.5k	668	0.333	0.239	1.99
45-2.5k-2h	1468	0.719	0.534	1.96
45-2.5k-4h	2650	1.400	1.053	2.11
45-2.5k-6h	3163	2.012	1.394	2.54

[a]Specific surface area by BET (Brunauer-Emmett-Teller) method.

[b]Total pore volume obtained by total single point adsorption of the pores less than 300nm at *P/Po*=0.99.

[b]Micro-pore volume obtained by *t*-plot method.

[d]Pore size distribution calculated by BJH(Barrett-Joyner-Halenda) method.