Electronic Supplementary Material (ESI) for Sustainable Energy & Fuels.

Supporting information

Carbon onion / sulfur hybrid cathodes via inverse vulcanization for lithium sulfur batteries

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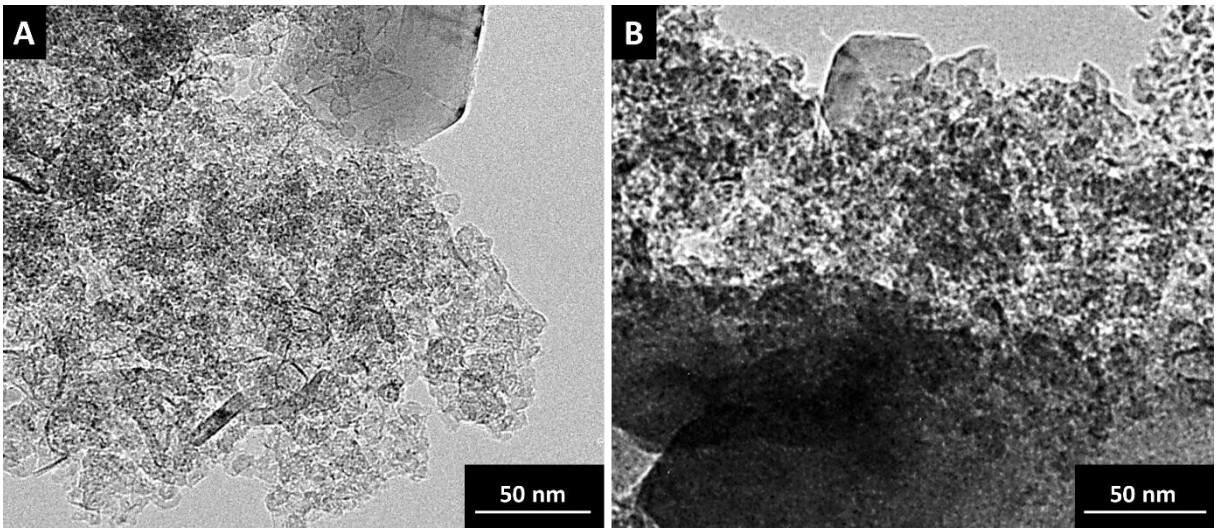

Figure S1: Transmission electron micrographs of (A) S-DIB-OLC-20 and (B) S-DIB-OLC-10.

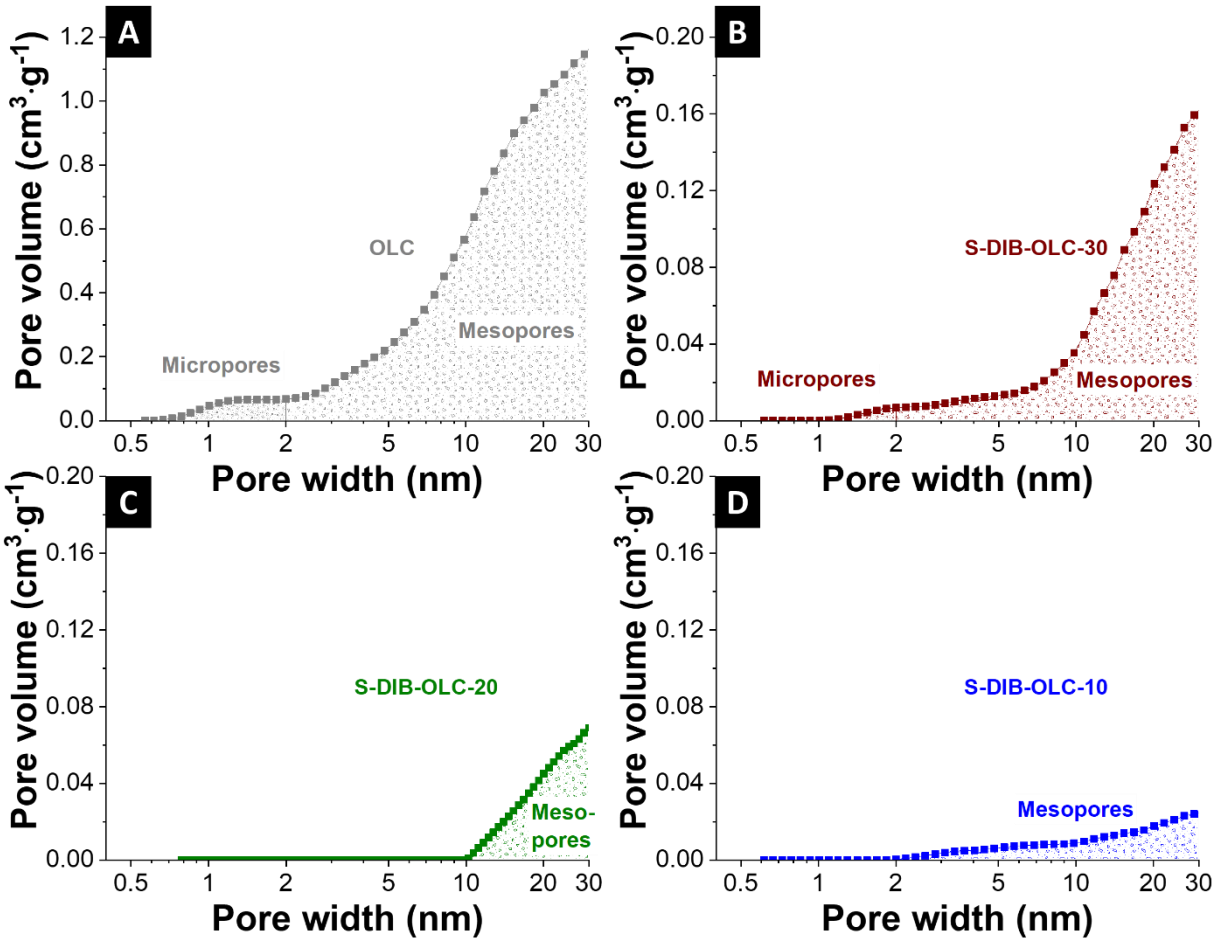

Figure S2: Cumulative pore size distributions per volume of carbon onions (dry powder) and S-DIB-OLC hybrids calculated with quenched-solid density functional theory from nitrogen gas sorption isotherms recorded at -196 °C.

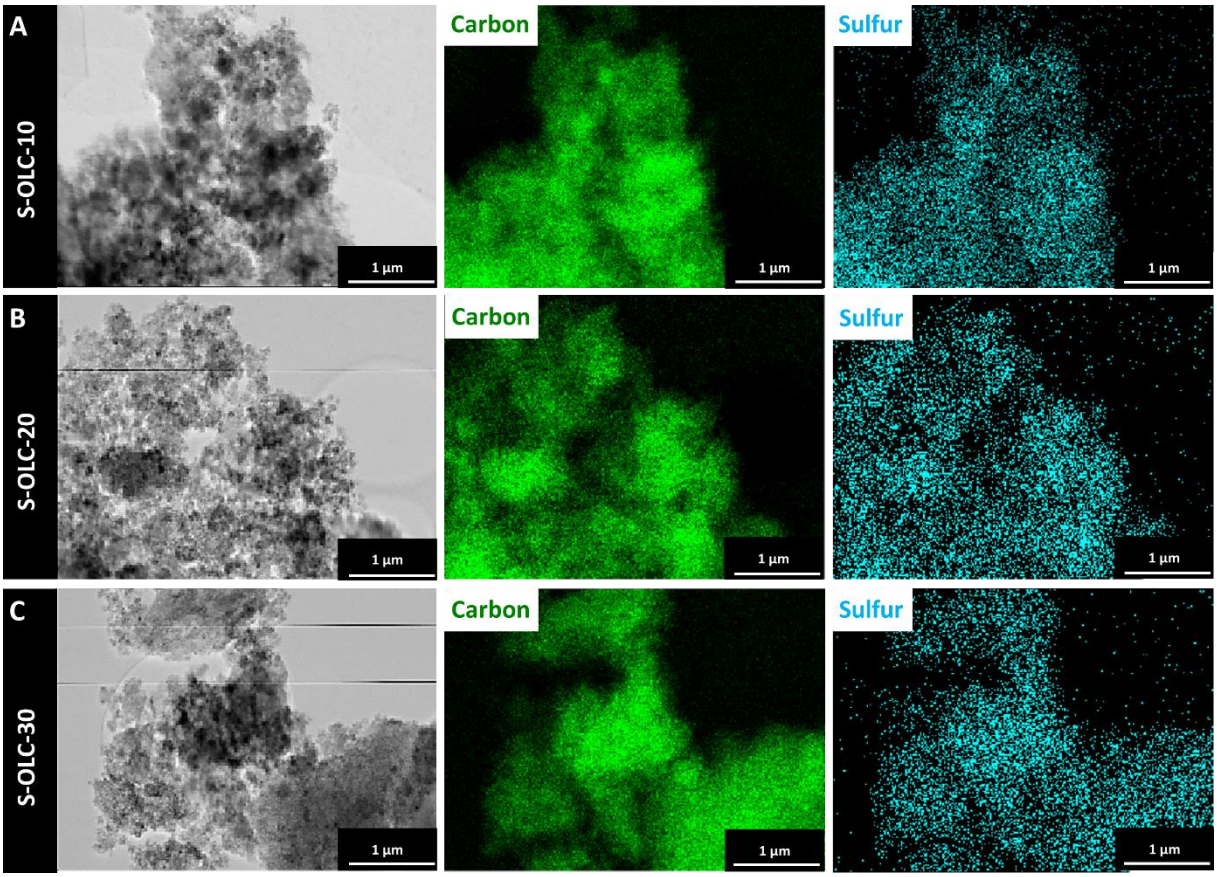

Figure S3: TEM micrographs of carbon onion / sulfur copolymer hybrids and their corresponding elemental EDX mappings.

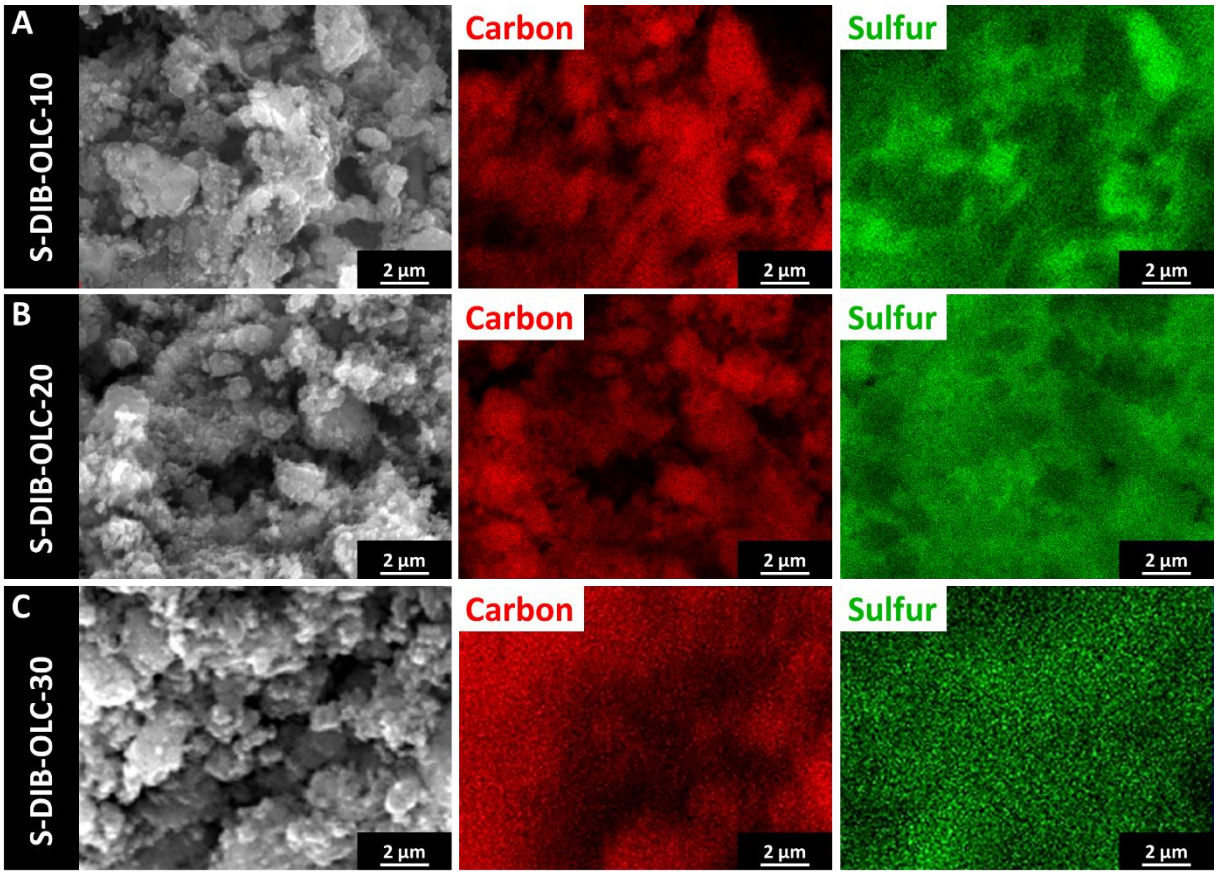

Figure S4: Scanning electron micrographs of carbon onion / sulfur copolymer hybrids and their corresponding elemental EDX mappings.

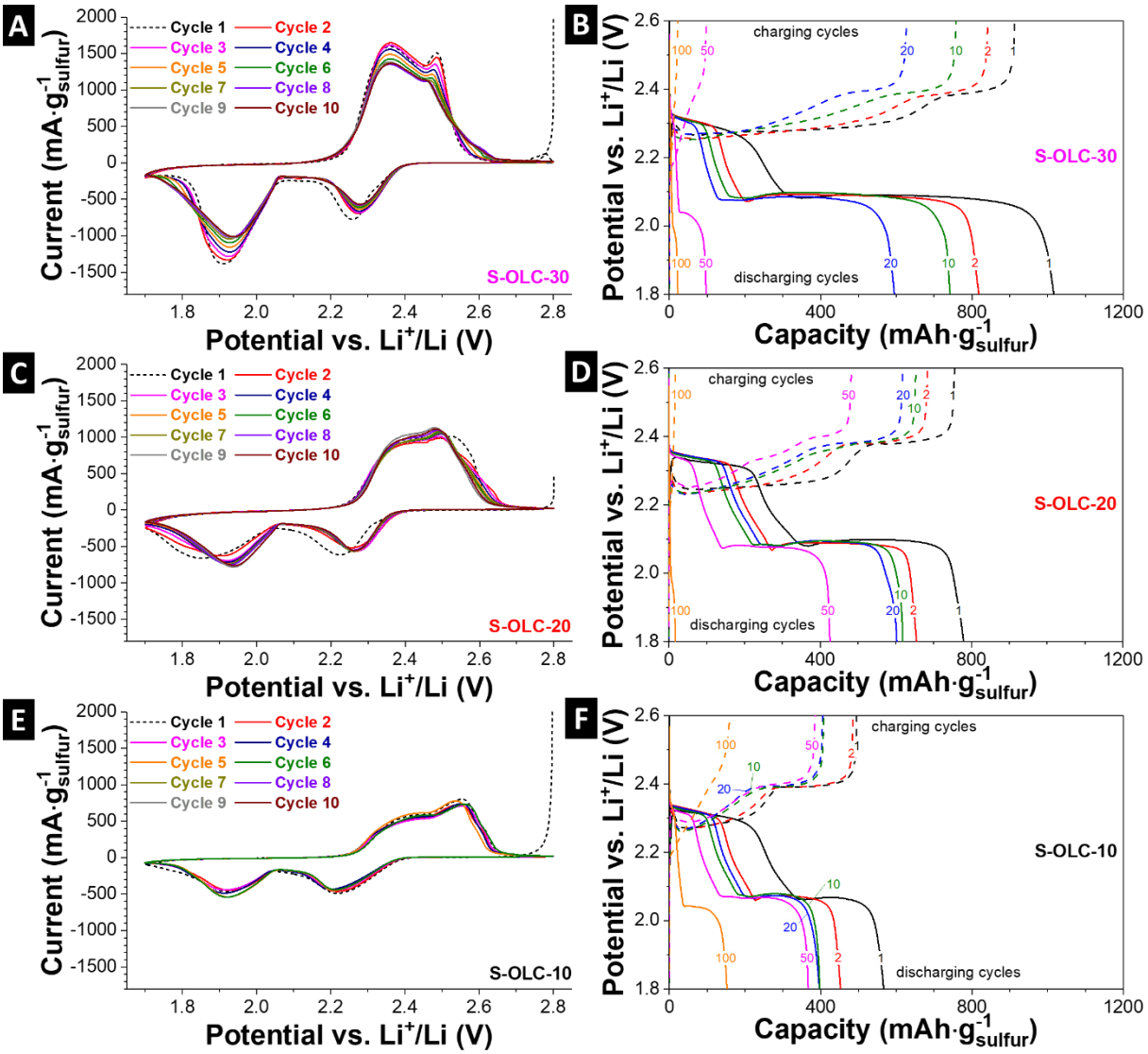

Figure S5: Cyclic voltammograms (measured in 3-electrode set-up) at a rate of 0.1 mV s^{-1} and galvanostatic charge/discharge (measured in 2-electrode set-up) profiles at 336 mA g^{-1} (0.2 C) for charging and 168 mA g^{-1} (0.1 C) for discharging in the potential window of +1.8 V to +2.6 V vs. Li^+/Li of (A and B) S-OLC-30, (C and D) S-OLC-20, and (E and F) S-OLC-10.

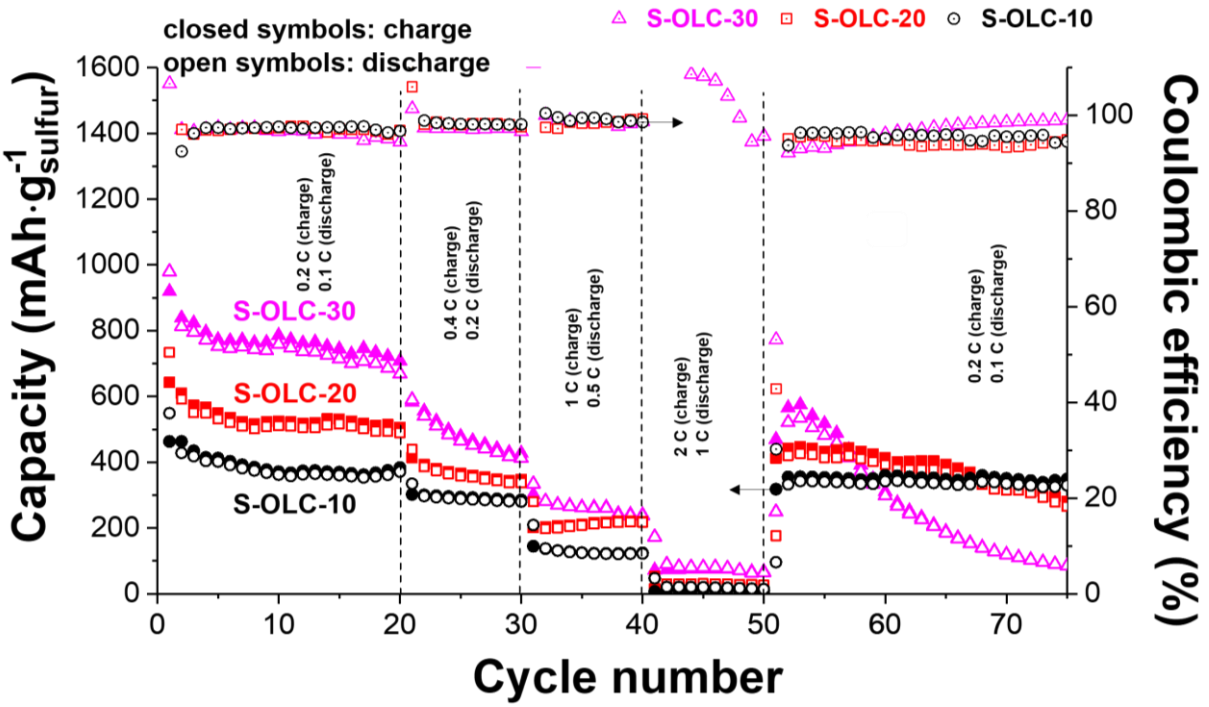

Figure S6: Rate handling of carbon onion / sulfur hybrids prepared by melt-diffusion measured in 3-electrode set-up.

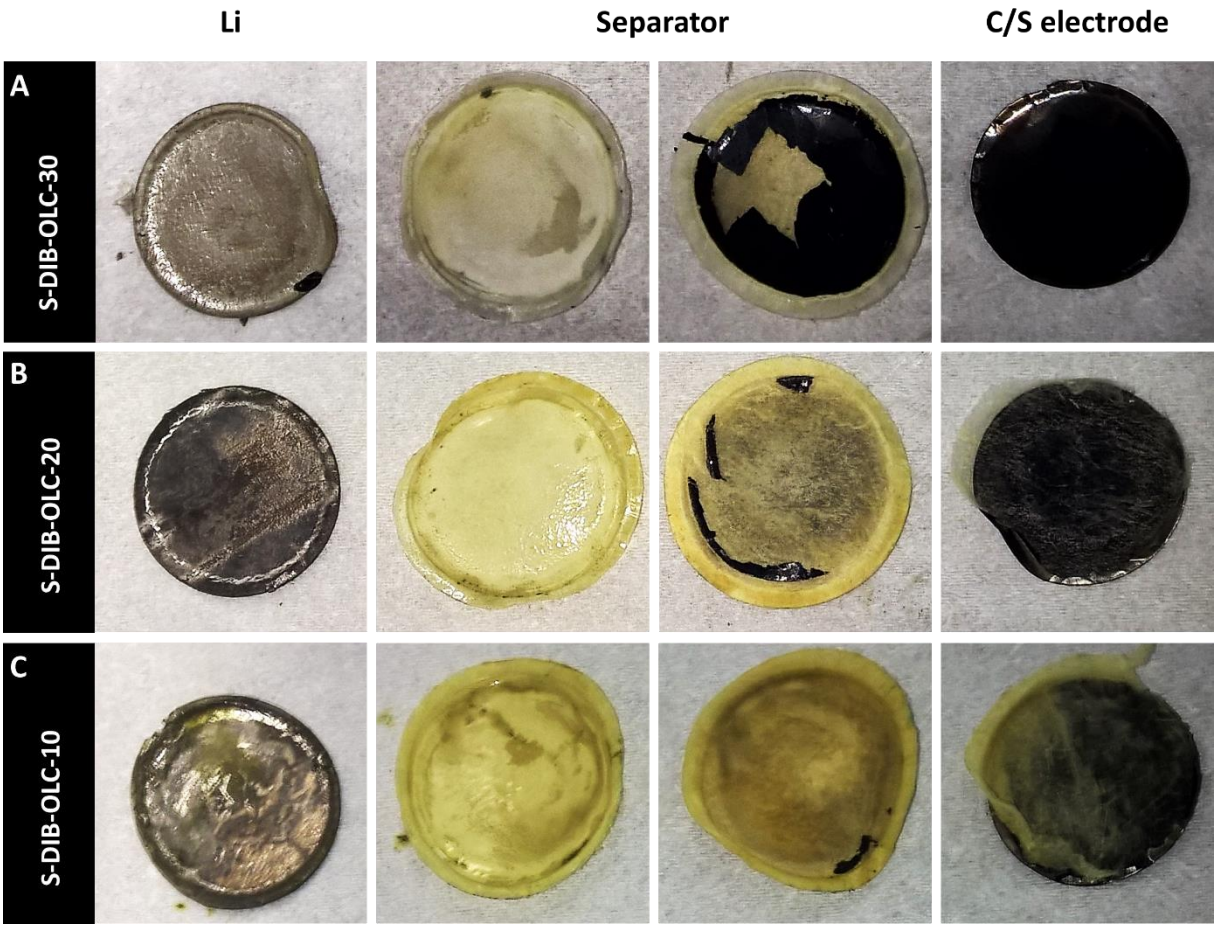

Figure S7: Digital photographs of carbon onion / sulfur copolymer hybrid cell parts after 100 charge-discharge cycles.

Table S1: Nitrogen gas sorption measurements of carbon onion and carbon onion / sulfur-DIB copolymer hybrids.

	Surface area ($m^2 \cdot g^{-1}$)		Pore volume ($cm^3 \cdot g^{-1}$)
	BET	**DFT**	
OLC	430.4	403.6	1.23
S-DIB-OLC-30	42.7	34.1	0.174
S-DIB-OLC-20	16.1	8.7	0.08
S-DIB-OLC-10	11.2	6.8	0.027