

Fabrication of Textile Waste Fibers Aerogels with Excellent Oil/Organic Solvent Adsorption and Thermal Properties

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Table S1 Thermal stability of aerogels

Sample Name	125 °C weight loss (%)	T ₅ % ¹ (°C)	T ₁₀ % ² (°C)
Uncoated aerogel	4.5	233.6	270.2
TW01	0.8	263.2	279.1
TW02	1.1	255.9	288.9
TW03	0.4	270.3	292.8

¹ The temperature of weight loss 5%.

² The temperature of weight loss 10%.

Table S2. The mechanical property of the TWF aerogels.

Sample Name	Young's modulus (kPa)	Strain 10% (kPa)	Strain 50% (kPa)
TW01	1.30 ± 0.16	19.9	60.1
TW02	2.97 ± 0.21	42.1	128.6
TW03	4.34 ± 0.19	54.0	199.6
TW04	5.24 ± 0.22	67.1	235.1

Table S3. The motor oil absorption capabilities of TWF aerogels.

Sample Name	Oil absorption capacity (g/g)			
	5W-30		5W-40	
	25 °C	75 °C	25 °C	75 °C
TW01	18.6 ± 1.2	15.3 ± 0.3	16.0 ± 1.5	15.5 ± 0.3
TW02	14.1 ± 0.5	13.7 ± 0.3	13.5 ± 0.5	13.3 ± 0.3
TW03	11.6 ± 0.5	10.2 ± 0.3	10.6 ± 0.4	10.1 ± 0.2
TW04	9.4 ± 0.2	8.3 ± 0.1	8.7 ± 0.3	8.4 ± 0.1

Table S4. Specification of motor oil.

Motor Oil	Viscosity (mPa·s)		
	25 °C	50 °C	75 °C
5W-30	96.6	50.4	21.0
5W-40	117.8	55.6	29.6

Table S5. Effect of cycles of sorption on oil absorption capacity and squeezed ratio of absorbed oil.

cycles	Oil absorption capacity(g/g)	Squeezed ratio of absorbed oil (%)
1	18.6 ± 1.2	79.9 ± 3.0
2	3.2 ± 0.3	97.3 ± 1.3
3	2.8 ± 0.2	98.5 ± 1.0
4	2.7 ± 0.2	99.3 ± 0.4

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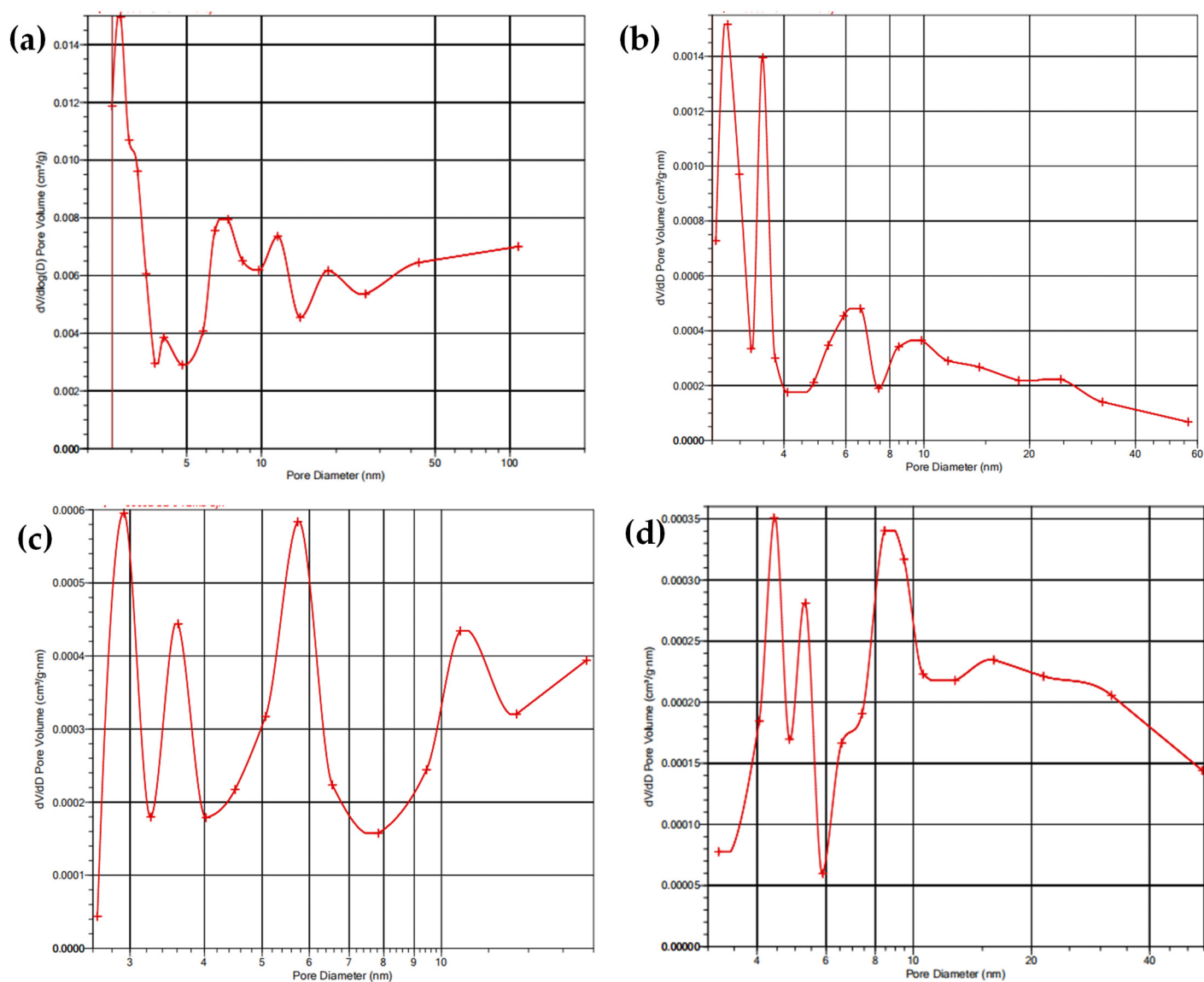


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5	2.8 ± 0.2	99.4 ± 0.3
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Table S6. Absorption capacity of TW01 for various solvents

Organic Solvent	Density (g/cm^3)	Absorption capacity(g/g)
Chloroform	1.490	26.9 ± 0.6
N,N-Dimethylformamide	0.944	18.6 ± 0.3
Methyl methacrylate	0.943	18.3 ± 0.5
Methylbenzen	0.872	17.3 ± 0.7
Ethanol	0.789	16.2 ± 0.5
Diethyl ether	0.713	14.2 ± 0.3

**Figure S1.** Pore size distribution: a) TW01, b) TW02, c) TW03 and d) TW04.