

Supplementary Data

Fly Ash Electrodes Fabricated by Acid-Assisted Subcritical Water

Extraction Method for Supercapacitor Application

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Table S1. GCD curves of SWE treated-FA electrodes in 3 M KOH solution.

Samples	Current density (A.g ⁻¹)	ΔV (V)	Δt (s)	Specific Capacitance (F.g ⁻¹)	Energy density (W.h.kg ⁻¹)	Power density (W.kg ⁻¹)
FA-H ₂ O	2	0.5	52	208	7	500
FA-0.1 M	2	0.5	60	240	8	500
FA-0.5 M	2	0.5	155	620	22	500

FA-1 M	2	0.5	108	432	15	500
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Table S2. GCD curves of FA-0.5 M sample under different current densities in 3 M KOH solution.

Current density (A.g⁻¹)	ΔV (V)	Δt (s)	Specific Capacitance (F.g⁻¹)	Energy density (W.h.kg⁻¹)	Power density (W.kg⁻¹)
2	0.5	155	620	22	500
4	0.5	73.5	588	20	1000
6	0.5	40.3	484	17	1500
8	0.5	21.2	339	12	2000
10	0.5	10.3	206	7	2500

Table S3. Values of electrolyte resistance (R_s) and charge-transfer resistance (R_{ct}) of SWE-treated FA supercapacitors

Samples	R_s (Ω)	R_{ct} (Ω)
FA-H₂O	0.23	0.87
FA-0.1 M	0.25	0.58
FA-0.5 M	0.15	0.35
FA-1 M	0.15	1.38

Table S4. GCD curves of FA-0.5 M // AC cell under different current densities in PVA-KOH gel electrolyte.

Current density (A.g⁻¹)	ΔV (V)	Δt (s)	Specific Capacitance (F.g⁻¹)	Energy density (W.h.kg⁻¹)	Power density (W.kg⁻¹)
2	1.6	222	278	99	1600
4	1.6	89	223	79	3200
6	1.6	50	188	67	4800
8	1.6	26.5	133	47	6400
10	1.6	14.8	93	33	8000

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Table S5 Metal content in SWE-treated FA samples as determined by aqua regia digestion method using ICP analysis.

Element	Content (mg/g)	Leaching efficiency (%)			
		FA-H ₂ O	FA-0.1 M	FA-0.5 M	FA-1 M
Al	71.32 ± 2.84	47%	54%	79%	87%
Ca	54.06 ± 0.89	55%	86%	100%	100%
Fe	36.55 ± 0.26	66%	87%	100%	100%
Mn	0.49 ± 0.02	74%	87%	100%	100%

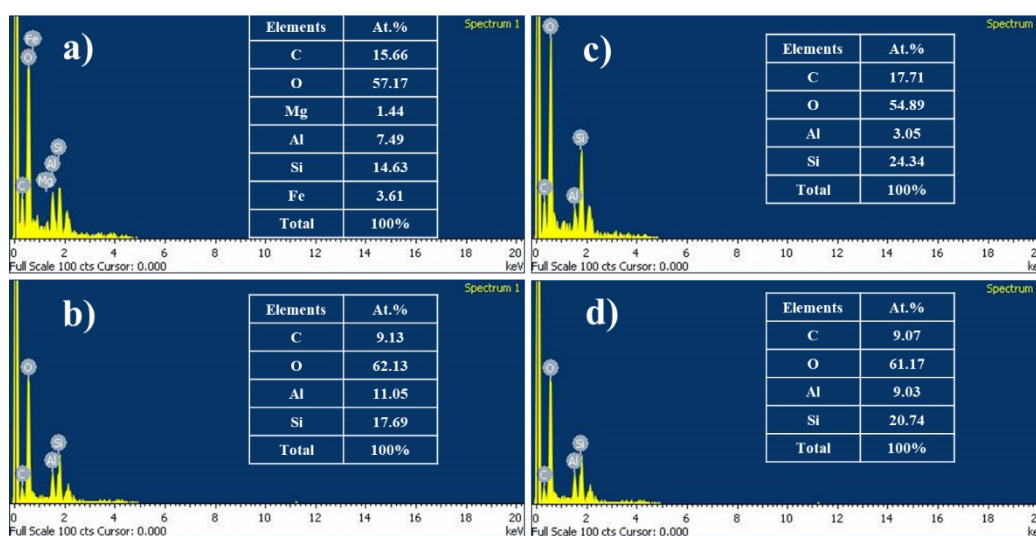


Fig. S1. The quantitative elemental composition of (a) FA-H₂O, (b) FA-0.1 M, (c) FA-0.5 M, and (d) FA-1 M by EDS analysis.