

Supporting information

Table S1 Total charges and amounts of n-GaN losses in samples etched in various conditions.

Electrolyte	Concentration, M	Voltage, V	n-GaN loss, mol	Charge, C	z
H ₂ SO ₄	5×10^{-5}	20	0.0003	203.9	5.99
H ₂ SO ₄	0.05	5	—	111.2	—
H ₂ SO ₄	0.05	10	0.007	3985.2	6.01
H ₂ SO ₄	0.05	15	0.010	5987.1	6.17
H ₂ SO ₄	0.05	20	0.016	9842.6	6.24
H ₂ SO ₄	0.25	15	0.100	59964.0	6.18
H ₂ SO ₄	0.5	20	0.452	263971.2	5.88
Na ₂ SO ₄	0.1	5	—	0.03	—
Na ₂ SO ₄	0.1	10	—	46.3	—
Na ₂ SO ₄	0.1	15	0.0003	172.4	5.73
Na ₂ SO ₄	0.1	20	0.001	537.5	6.19
Na ₂ SO ₄	1	20	0.088	52642.2	6.17
NaOH	1×10^{-4}	20	0.0003	165.0	5.92
NaOH	1×10^{-3}	20	0.0123	7173.4	6.08
NaOH	0.1	5	0.001	574.6	5.81
NaOH	0.1	10	0.010	5875.91	6.23
NaOH	0.1	15	0.086	51381.8	6.20
NaOH	0.1	20	0.321	183487.9	5.93

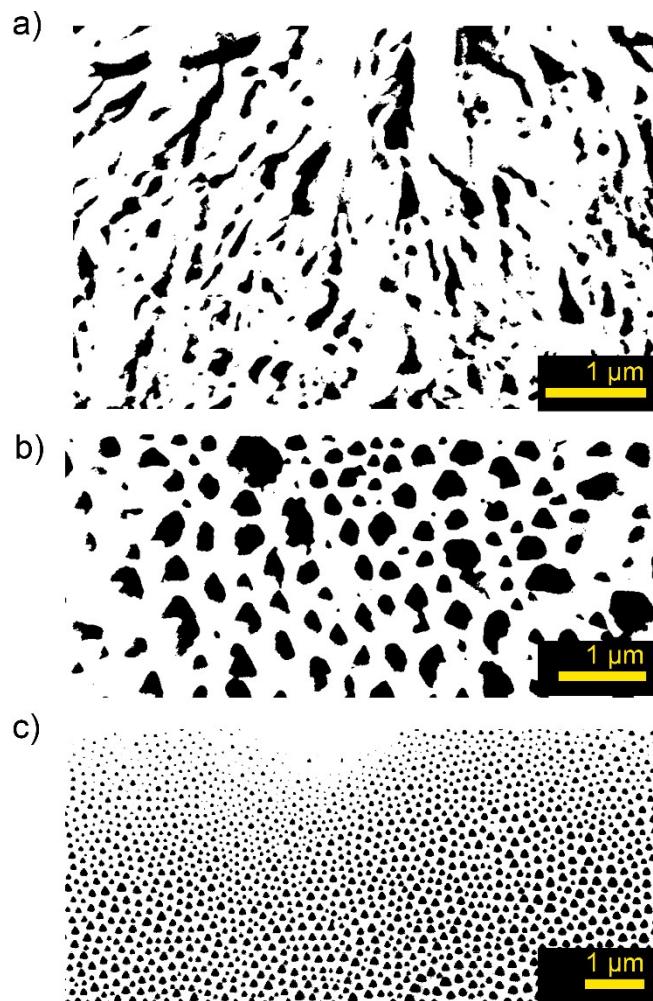


Fig. S1 Observations of nanoporous structures of n-GaN after etching in (a) 0.25 M H_2SO_4 at 15 V, (b) 1 M Na_2SO_4 at 20 V, and (c) 0.1 M NaOH at 15 V

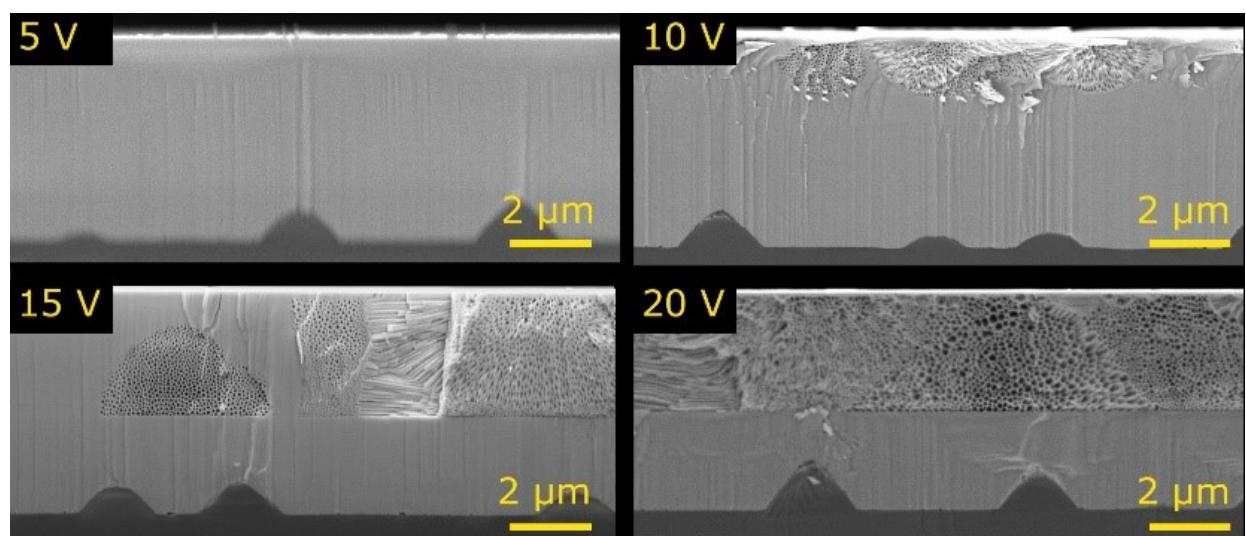


Fig. S2 SEM of samples etched in 0.1 M NaOH .

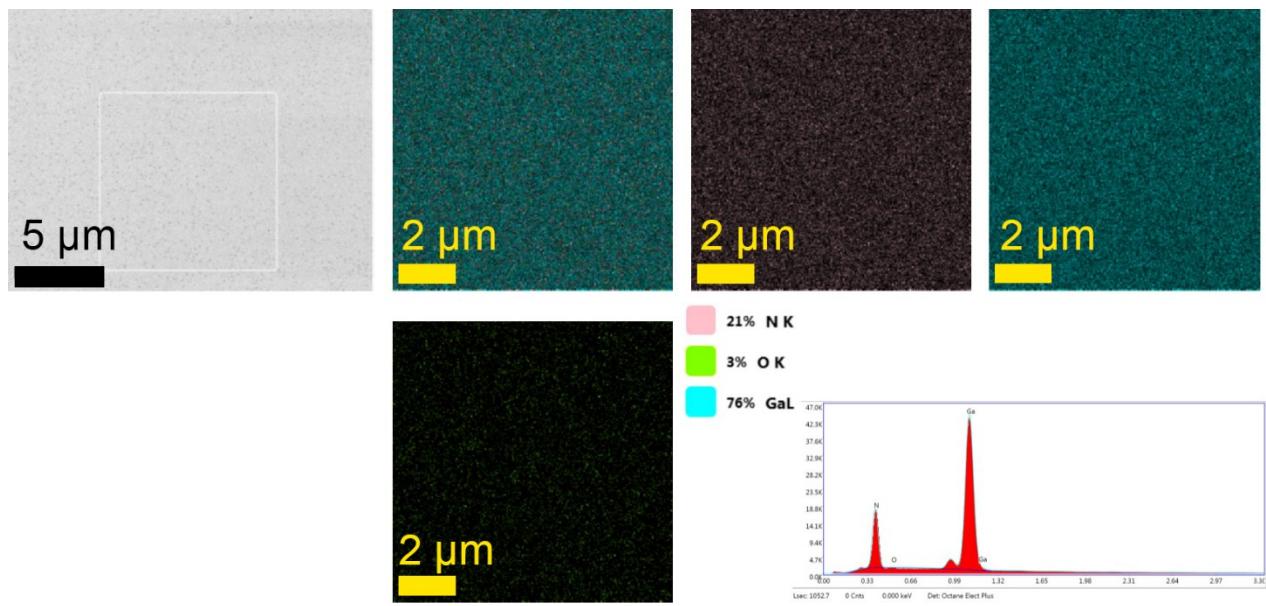


Fig. S3 EDS mapping of surface of sample etched in 0.25 M H_2SO_4 .

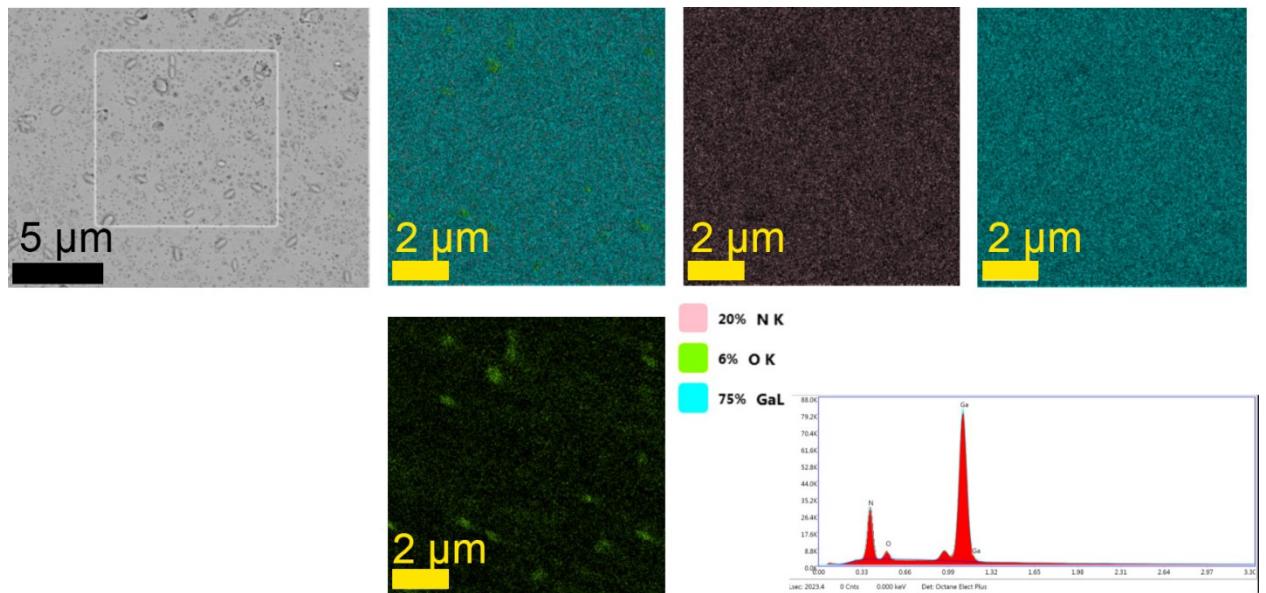


Fig. S4 EDS mapping of surface of sample etched in 1 M Na_2SO_4 .

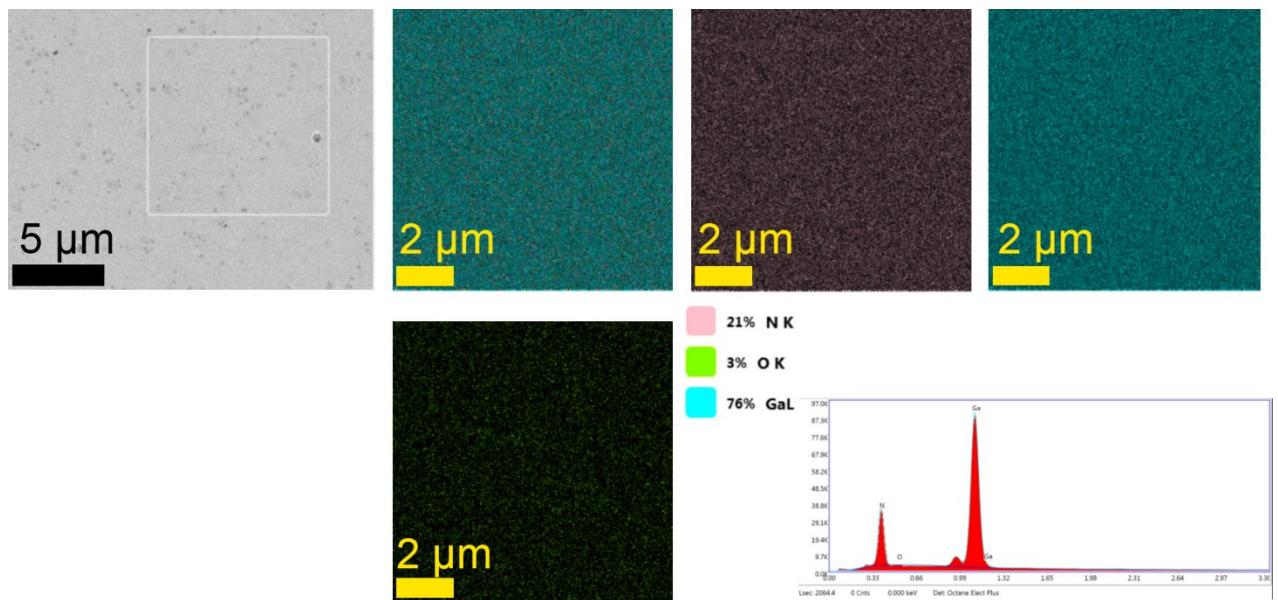


Fig. S5 EDS mapping of surface of sample etched in 0.1 M NaOH.

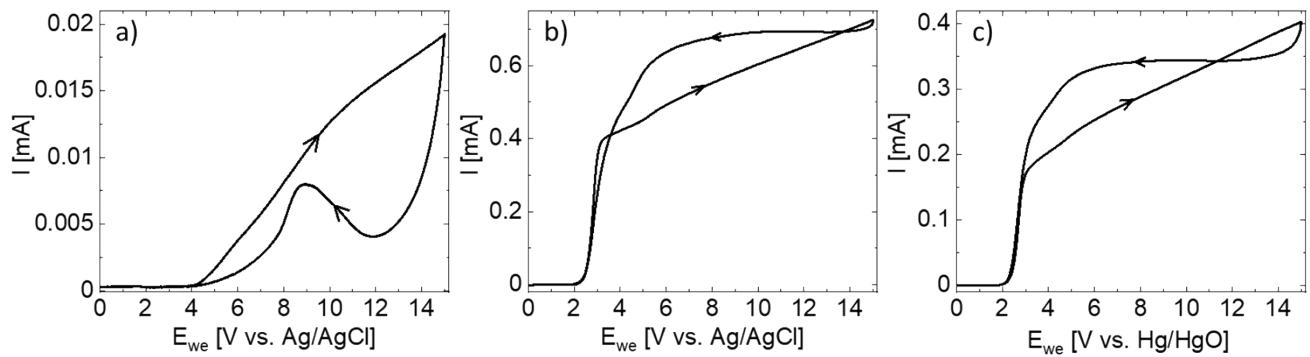


Fig. S6 Voltammograms of n-GaN working electrodes in (a) 0.05 M H₂SO₄, (b) 0.1 M Na₂SO₄ and (c) 0.1 M NaOH. Current values are normalized to 1 cm² of n-GaN sample.