

Supplementary Information

CVD grown GaSb_xN_{1-x} films as visible-light active photoanodes.

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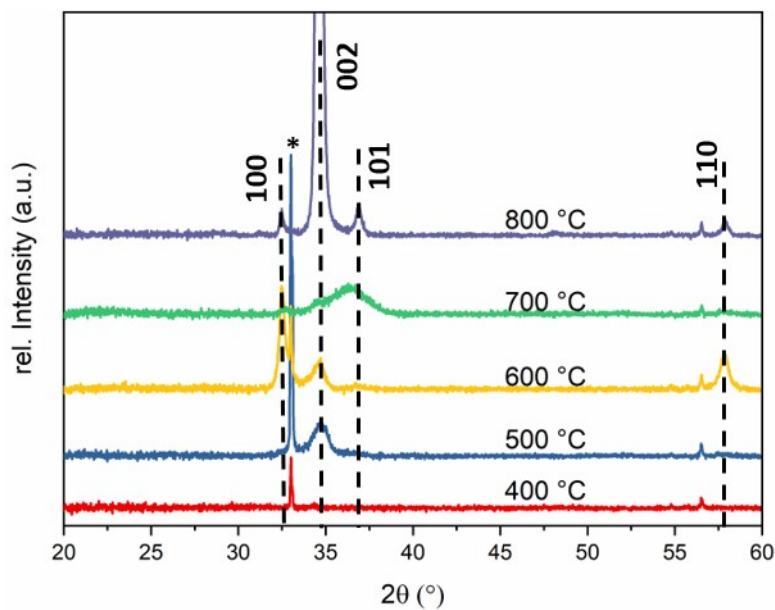


Fig. S1: X-ray diffraction patterns of GaN thin films deposited on Si(100) at different substrate temperatures using $[\text{Ga}(\text{Me})(\text{dpamd})_2]$ and NH_3 as precursors. (Reference: JCPDS No. 00-002-1078). The asterisk denotes the forbidden (002) reflex of the underlying Si.

Table S1: Composition (as determined via RBS/NRA) of GaN thin films grown on Si(100) as a function of deposition temperature .

T_{dep} (°C)	C (at.%)	N (at.%)	O (at.%)	Ga/N
400	8.6	10.7	48.6	3
500	5.2	41.0	6.1	1.2
600	7.3	40.6	3.5	1.2
700	7.9	41.5	2.6	1.2
800	2.5	43.2	3.8	1.2

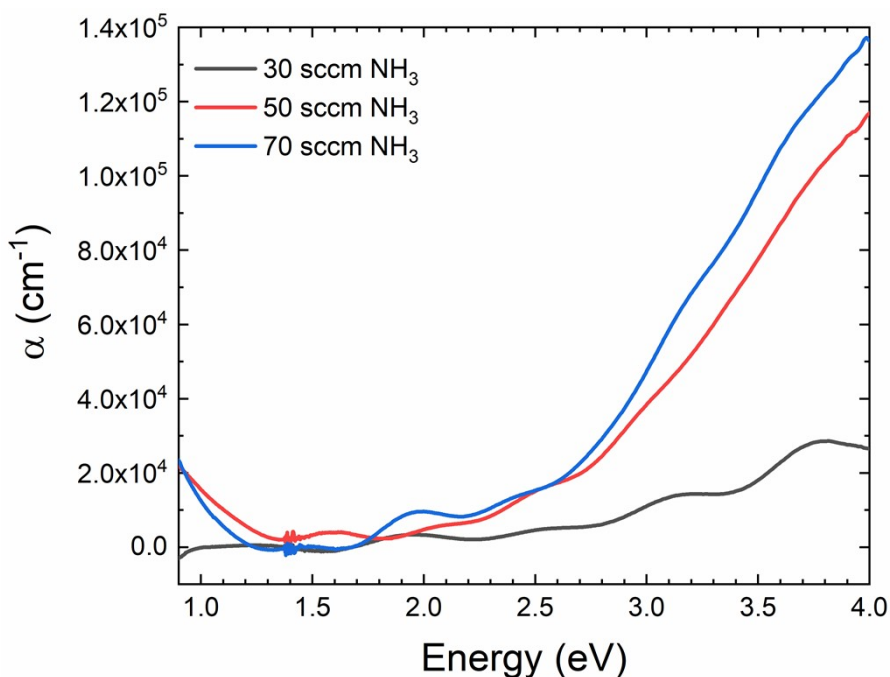


Fig. S2: Absorption coefficient for the $\text{GaSb}_x\text{N}_{1-x}$ thin films on FTO substrates deposited at 600°C .

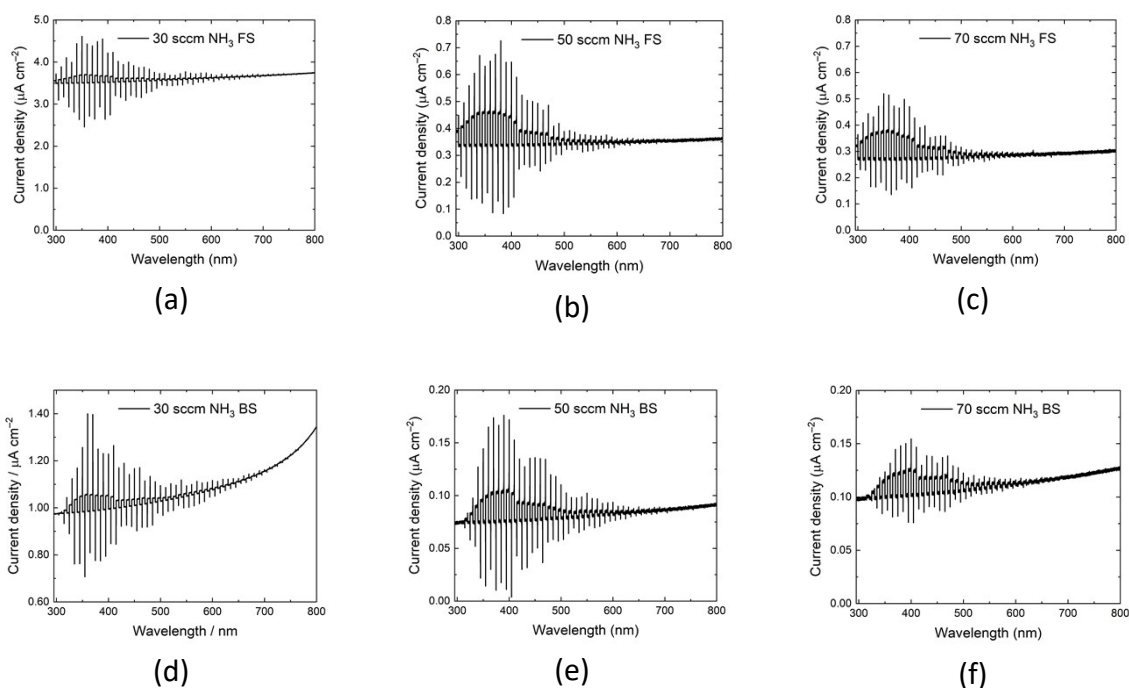


Fig. S3: Wavelength dependent photocurrent transients for $\text{GaSb}_x\text{N}_{1-x}$ thin films measured at 1.25 V vs. RHE in borate buffer (0.1 M , $\text{pH } 9.2$) containing $0.1\text{ M Na}_2\text{SO}_3$ under intermittent monochromatic irradiation ($5\text{ s light, } 5\text{ s dark}$) for the thin films on FTO (prepared at 600°C) from the (a)-(c) front side (FS) and (d)-(f) back side (BS).

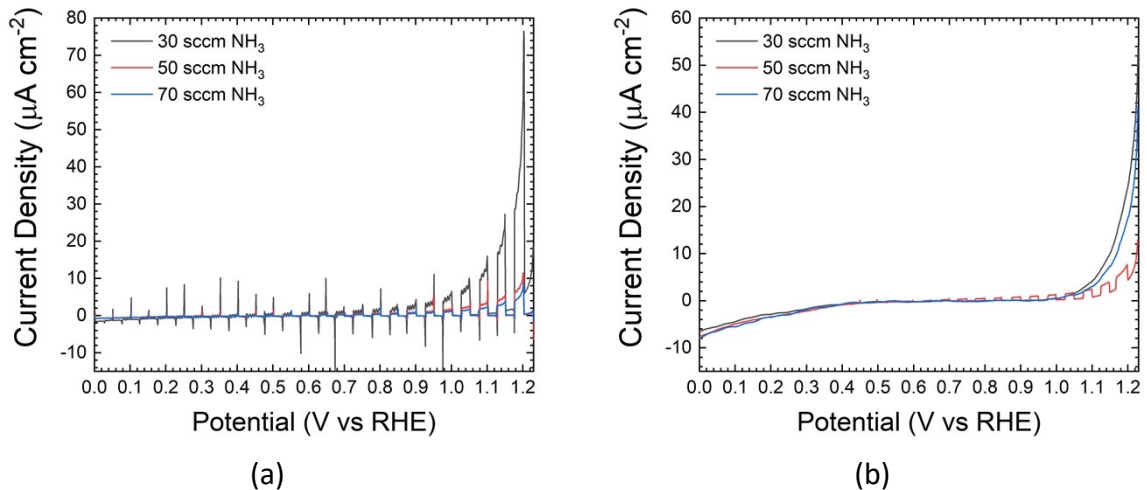


Fig. S4: Potential-dependent photocurrent for $\text{GaSb}_x\text{N}_{1-x}$ thin films measured at thin electrodes in borate buffer (0.1 M, pH 9.2) in the presence of 0.1 M Na_2SO_3 under intermittent (5 s light / 5 s dark) solar irradiation (Xe-Lamp with a AM-1.5G filter, 100 mW/cm^2) (a) thin films on FTO, prepared at 600 °C and illuminated from the back (substrate) side, (b) thin films on GC (glassy carbon), prepared at 800 °C and illuminated from the front (electrolyte) side.

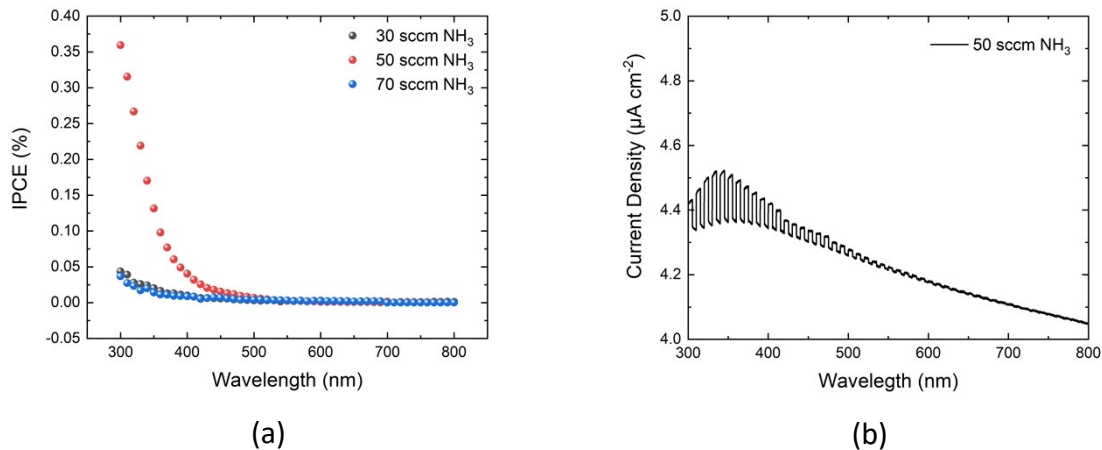


Fig. S5: (a) Photoaction spectra of the $\text{GaSb}_x\text{N}_{1-x}$ thin films deposited on glassy carbon substrates (prepared at 800 °C) measured at 1.25 V vs. RHE in borate buffer (0.1 M, pH 9.2) with addition of Na_2SO_3 (0.1 M) under intermittent monochromatic irradiation from the frontside (FS) (600 s idle at beginning, next 5 s light / 5 s dark), (b) corresponding photocurrent transients measured at the same conditions with interval of 10 nm.