

Supporting Information

Ultrathin ultraviolet cathodoluminescent device based on hexagonal boron nitride

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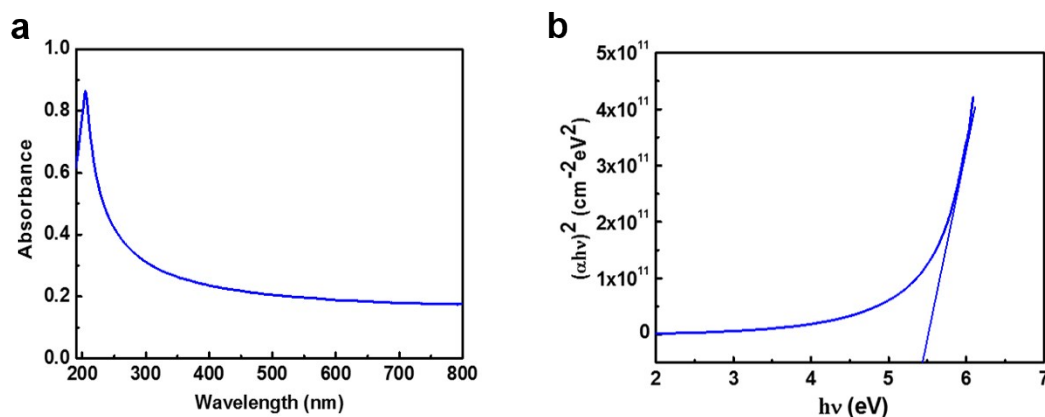


Figure. S1. UV-vis absorption spectra and optical band gap of Exf-hBN.

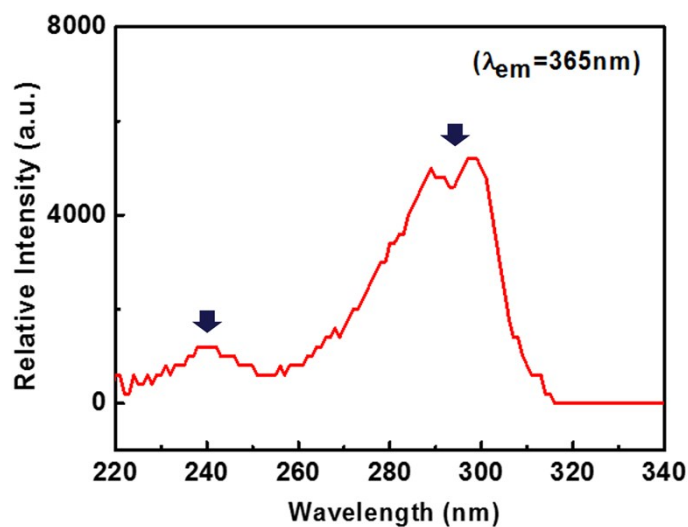


Figure. S2. The photoluminescence excitation (PLE) spectra measured at maximum PL peak position of the Exf-hBN.

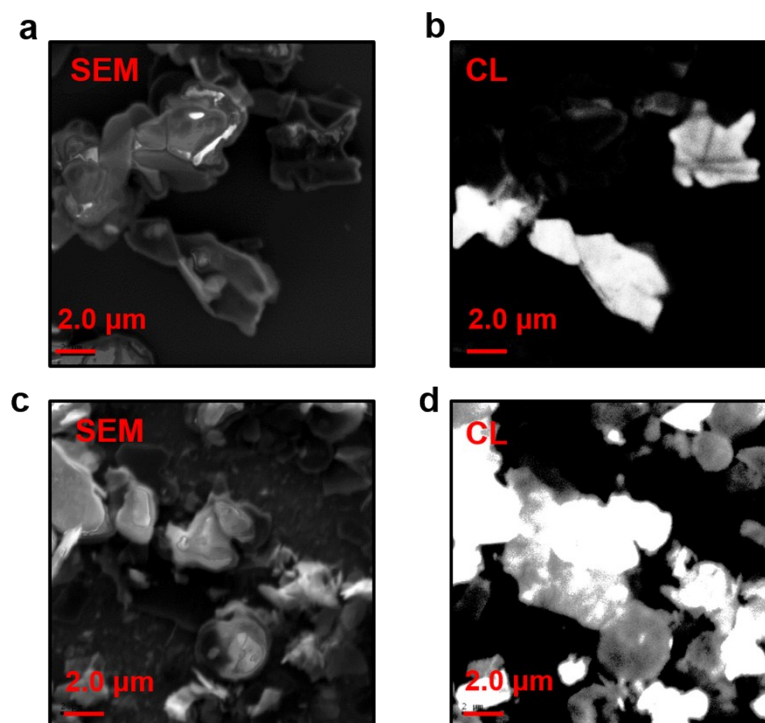


Figure. S3. SEM and CL images of Exf-*h*BN.

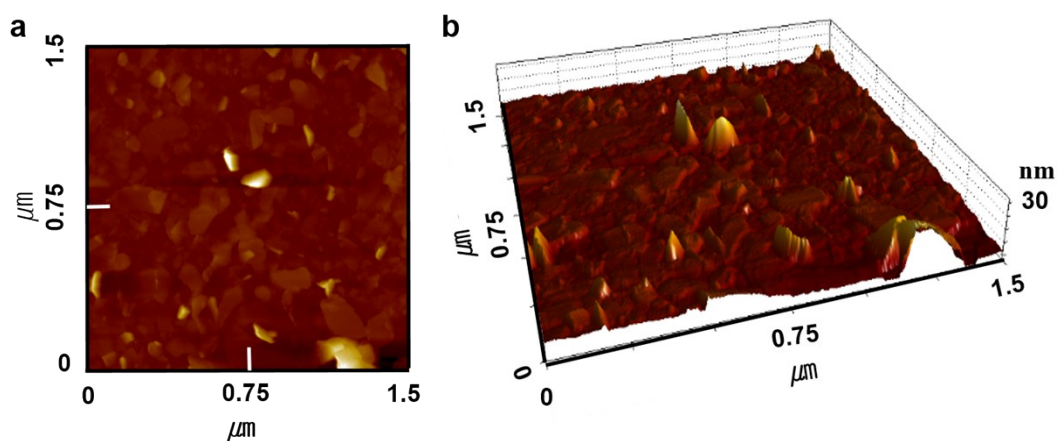


Figure. S4. Three-dimensional AFM surface image of Exf-*h*BN film deposited on the graphene-quartz substrate.

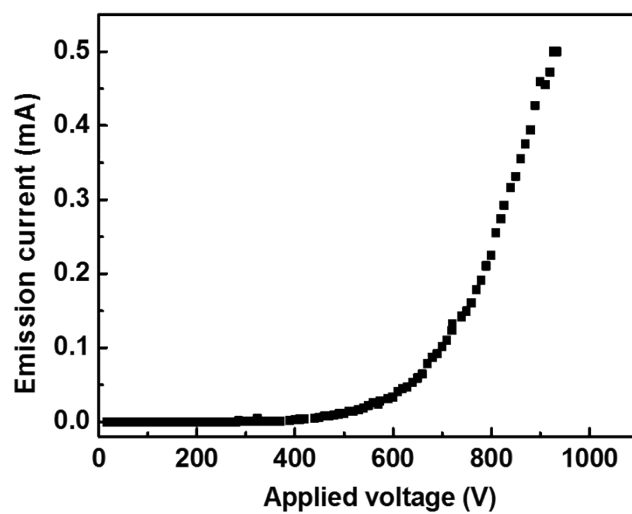


Figure. S5. Emission current and applied voltage characteristic curves of CNT/Ag field emitter

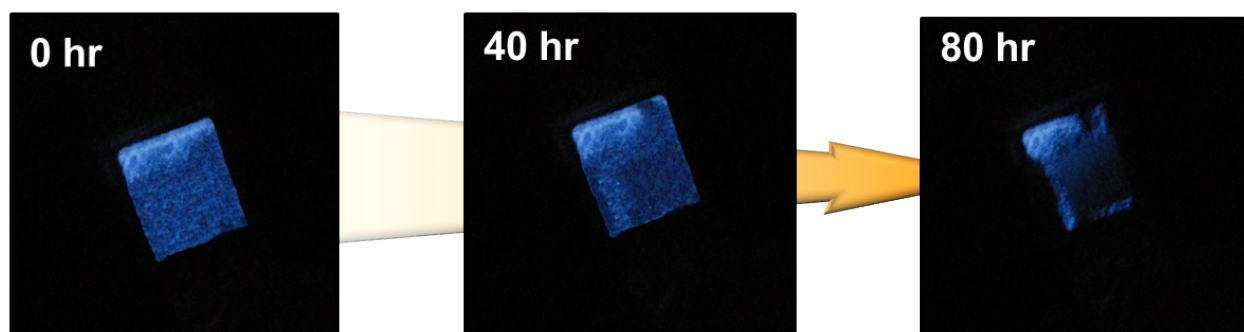


Figure. S6. Long-term duration test on the device at an accelerating voltage of 900 V.

Table S1. Field-emission performance parameters of several emitting materials reported in the literature.

Emitting Materials	Turn-on Field [V μm^{-1}]	Testing time	Ref.	Emitting Materials	Turn-on Field [V μm^{-1}]	Testing time	Ref.
CNT	1.2	50 h	[1]	CNT	1.27	10,000 h	[17]
CNT	5	90 h	[2]	Mo cone	-	Thousands of hours	[18]
CNT	5	25 h	[3]	ZnO nanotube	7	24 h	[19]
CNT	5	60-80 min	[4]	ZnS nanobelt	3.55	6 h	[20]
CNT	2.8	150 h	[5]	Si nanowire	14	24 h	[21]
CNT	2.9-4.3	30-510 h	[6]	WO ₃ nanotips	2	13.5 h	[22]
CNT	2	150	[7]	AlN nanotips	6	10 h	[23]
CNT-ZnO	5.3	700 min	[8]	AlN nanotips	4.7	4 h	[24]
C nanocoil	1.4	100 h	[9]	SiC nanowire	0.7-1.5	24 h	[25]
C nanocone	7-32	175	[10]	SiC nanowire	5	100 h	[26]
CNT	4.6	25 h	[11]	SiC nanowire	3.1-3.5	2 h	[27]
CNT	1.8	18 h	[12]	Cu ₂ S nanowire	11	16 h	[28]
CNT	1.8	3-18 h	[13]	ITO nanorod	3.8	20 h	[29]
CNT	-	6-25 h	[14]	GaN nanowire	8.5	10 h	[30]
DLC-CNT	2-3	30 h	[15]	BN nanosheet	4.2	10 h	[31]
CNT	0.7	5 h	[16]	CNT	1.7	80 h	This work

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