Supporting Information

Bottom-up synthesized crystalline boron quantum dots with nonvolatile memory effect through one-step hydrothermal polymerization of ammonium pentaborane and boric acid

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Supplementary Figures:

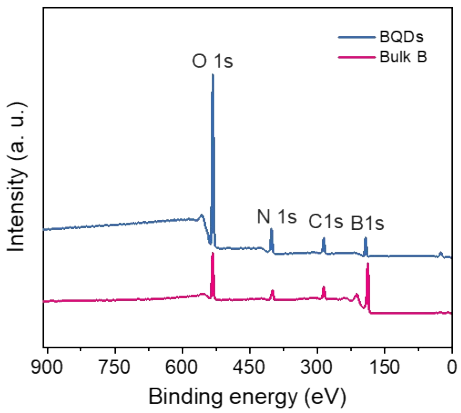

Fig. S1 XPS survey of BQDs and bulk boron.

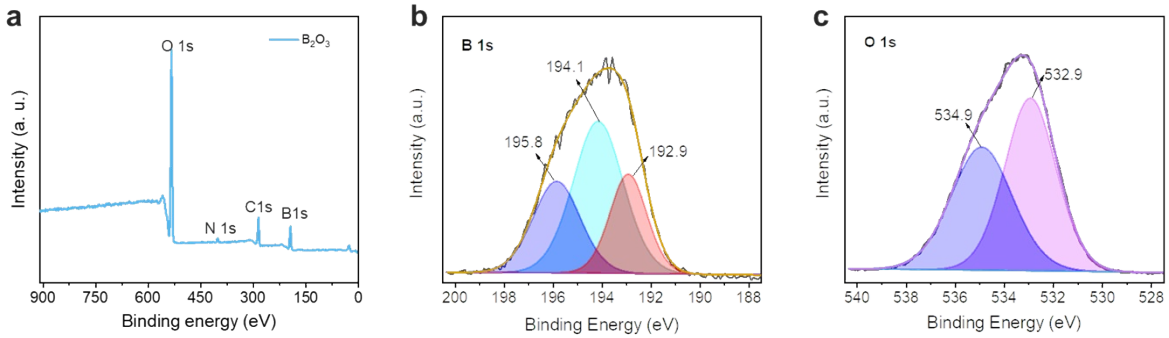

Fig. S2 XPS survey (a), high-resolution B 1s signal (b) and O 1s signal (c) of the commercial B_2O_3 powder.

Supplementary Tables:

Table S1 Components (at. %) of various element species for BQDs and bulk boron.

No.	B 1s	C 1s	N 1s	O 1s	B/O ratio
BQDs	28.03	14.18	12.37	45.42	0.62
Bulk boron	74.47	10.26	4.73	10.54	7.07

Table S2 Ratios of B1s components for BQDs and bulk boron.

No.	O─B─O		B─B─O		B─B		B─B─B	
	BE (eV)	Area/%	BE (eV)	Area/%	BE (eV)	Area/%	BE (eV)	Area/%
BQDs	192.2	8.13	190.5	8.78	188.6	15.85	187.2	67.23
Bulk boron	192.2	3.66	190.7	4.13	188.6	19.89	187.3	72.32

Table S3 Memory device performance of PVP-based composites

Active layer	Switch voltage (V)	ON/OFF ratio	Reference
C60-PVP	2.5	<10	[1]
BQDs-PVP	0.5	$\sim 10^3$	[2]
MoS_2-PVP	3.3	$\sim 10^2$	[3]
N-doped MoS_2-PVP	0.7	$\sim 10^3$	[4]
BPQD-PVP	2.9	$\sim 10^4$	[5]
Au NPs/ZnO nanorod-PVP	2.0	$\sim 10^3$	[6]
Tri-PVP	10.0	$\sim 10^2$	[7]
BQDs-PVP	5.0	$\sim 10^3$	This work

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