Supplementary Information (SI) for Journal of Materials Chemistry C.

Wide-bandgap Quantum Dots with Large-span Fluorescence Switching and Two-photon Emission *via* Protonation/Deprotonation

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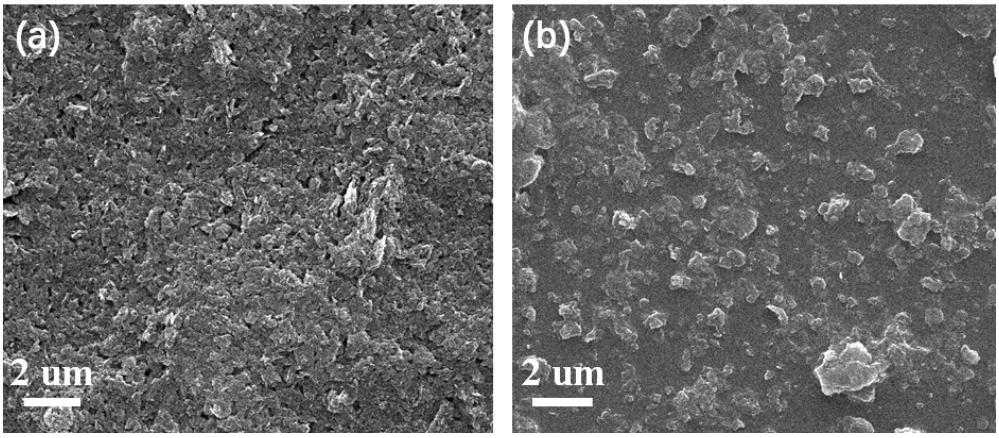

Figure S1. SEM of BN nanosheets before (a) and after (b) sonication exfoliation.

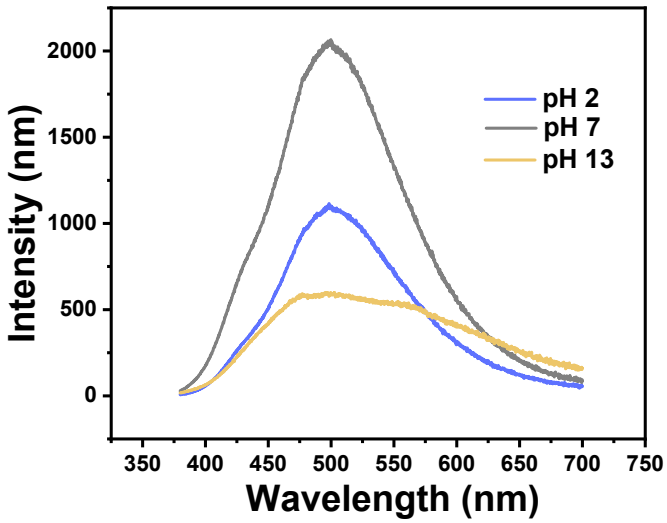

Figure S2. PL spectrum of BNQDs with any passivation under different pH.

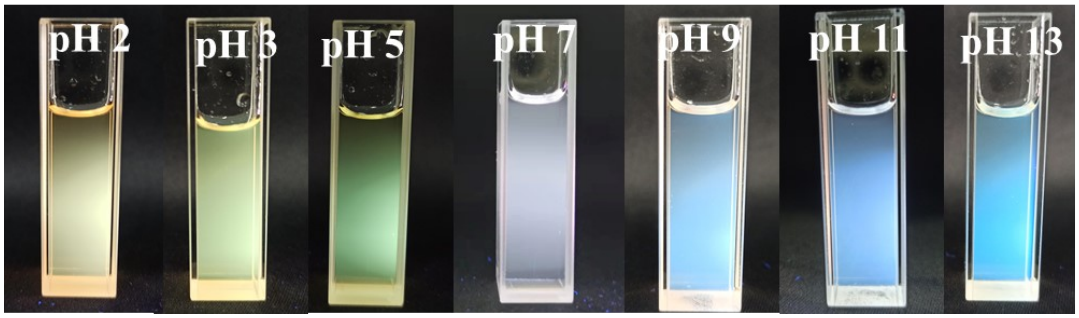

Figure S3. The optical images of BNQDs with different pH under 365 nm irradiation.

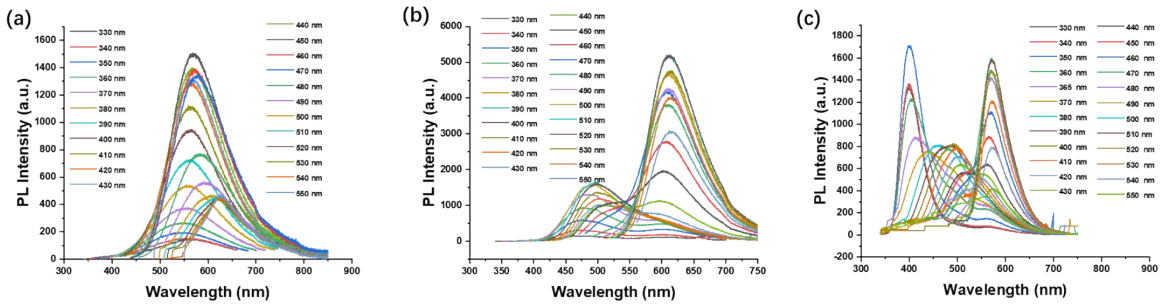

Figure S4. PL spectra of BNQDs under different irradiation wavelength at pH of 2 (a), 7 (b), and 13 (c).

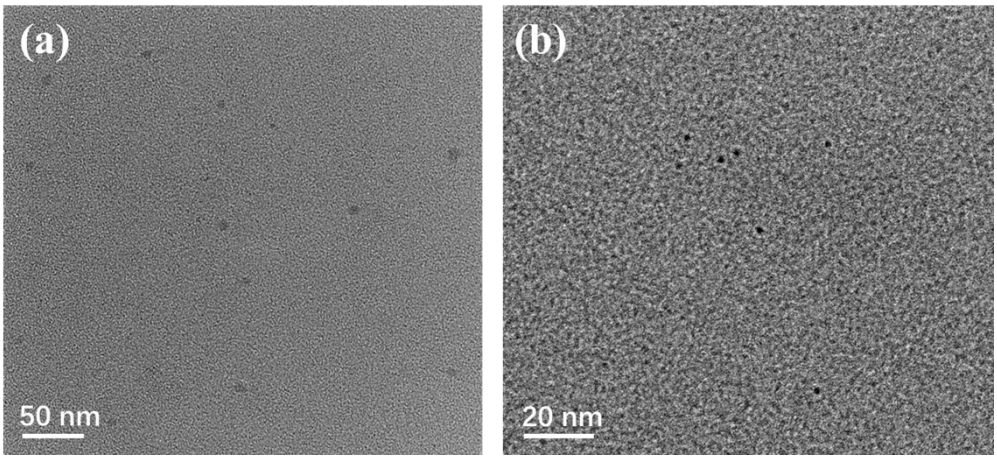

Figure S5. TEM of BNQDs by modulating pH of precursor reactants before hydrothermal reaction. The average sizes of QDs are 10 nm under pH 2 (a) and 5 nm under pH 13 (b).

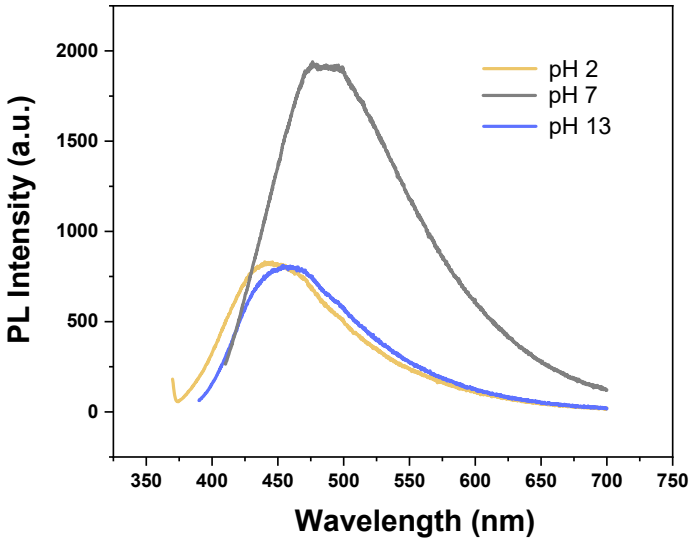

Figure S6. PL spectra of QDs by modulating pH of precursor reactants before hydrothermal reaction.

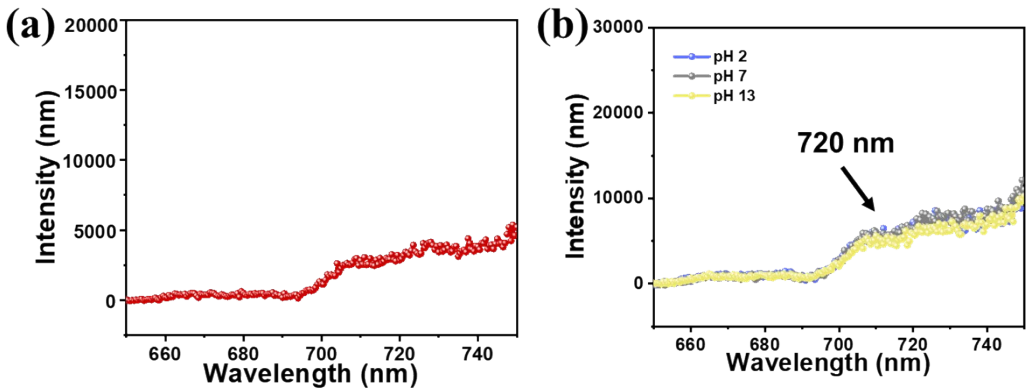

Figure S7. (a) Two-photon spectrum of pristine BNQDs without PPD. (b) Two-photon spectrum of BNQDs by modulating pH of precursor reactants before hydrothermal reaction.

Pristine QDs without passivation and the QDs by modulating pH before hydrothermal reaction still show two-photon emission at 720 nm with weak intensity, indicating that it is related with intrinsic electron phonon coupling between π-conjugated BN, rather than outside pH environment or sizes.

Table S1. The lifetime of BNQDs under different pH.

BNQDs	τ_1	τ_2
2	0.93 ns	9.99 ns
7	1.08 ns	7.29 ns
13	1.21 ns	6.83 ns

Table S2. The QY of BNQDs under different pH.

QDs with different pH	QY
2	7.64%
3	7.55%
5	6.66%
7	10.50%
9	6.03%
11	5.49%
13	4.38%