

Table S1 Lifetime intensity decays of B,N-WS₂ in water

B,N-WS ₂	$\tau_1=2.5361$	Rel% ₁ =83.93 %		$\chi^2=1.197$	$\tau=3.153$ us
	$\tau_2=14.3314$	Rel% ₂ =16.07%			

Table S2 Comparison of different fluorescent probes for Hg²⁺ detection

Materials	Linear range	Detection limit	Reference
CdSe/ZnS quantum dots	---	10 nM	S1
Nitrogen-doped carbon quantum dots	0–25 μ M	230 nM	S2
Au cluster-CdTe quantum dots	0.131–0.71 μ M	9 nM	S3
ssDNA-GO	0.03–0.18 μ M	30 nM	S4
SBA-15	---	1000 nM	S5
squaraine dye	1.0–10.0 μ M	13 nM	S6
mesoporous cerium phosphonate	0.05–1.5 μ M	16 nM	S7
rhodamine-glyoxylic acid B,N-WS ₂	---	16.9 nM	S8
WS ₂	0.01–10.0 μ M	23 nM	This work

Table S3 Detection of Hg²⁺ in lake water samples

Hg ²⁺ added (μ M)	Hg ²⁺ found (μ M)	Recovery (%)	R.S.D (%)
0.1	0.11	104.7	3.42
0.2	0.23	106.9	2.69
0.3	0.29	99.3	4.06
0.4	0.42	102.5	3.81

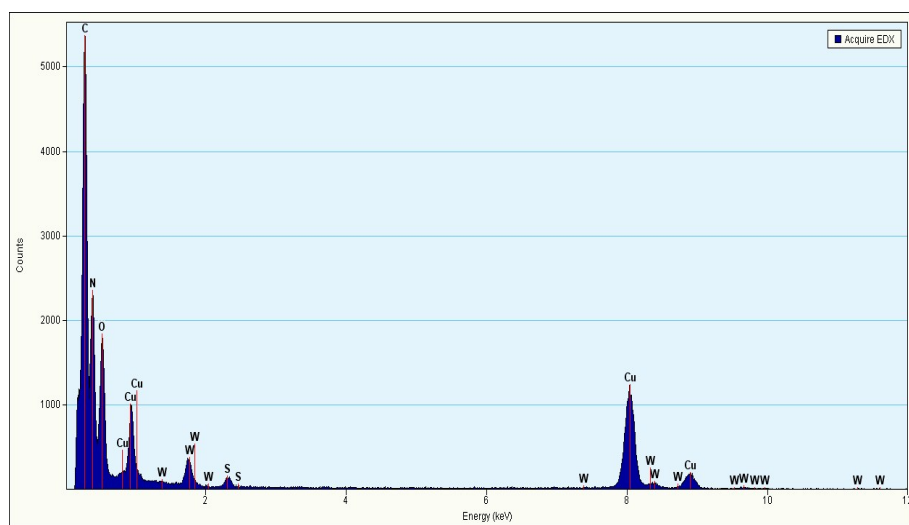


Fig. S1 The EDS of B,N-WS₂

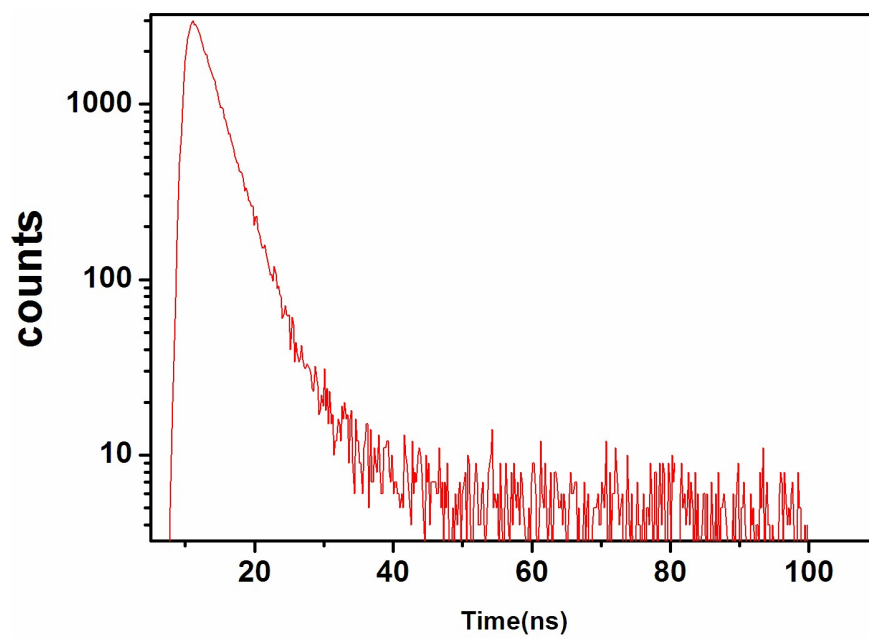


Fig. S2 The lifetime of B,N-WS₂

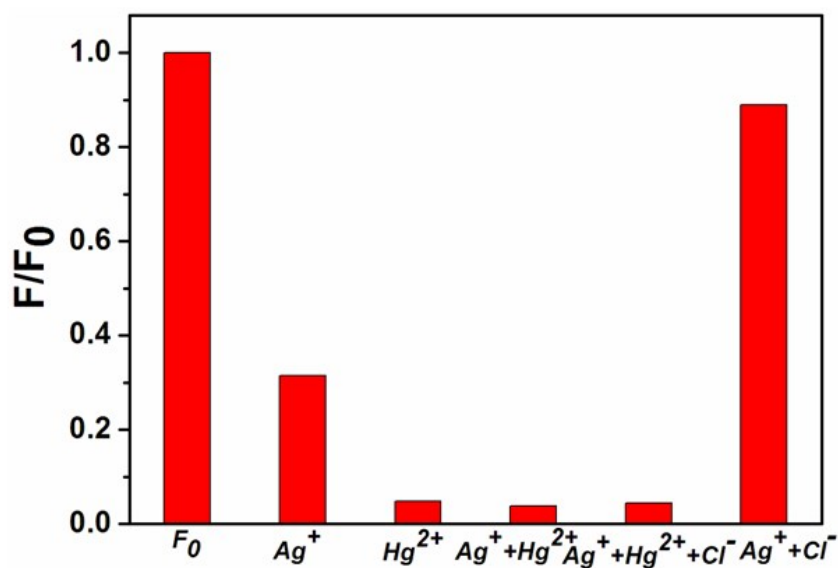


Fig. S3 PL intensities of B,N-WS2 dispersion under various conditions in aqueous solution.

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