1 Electronic Supplementary Material

2 3-Aminophenyl boronic acid-functionalized CuInS₂ quantum dots as a near-

3 infrared fluorescence probe for the detection of dicyandiamide

- 4 Siyu Liu^b, Shu Pang^a, Hui Huang^c, Xingguang Su^{a*}
- 5 *Corresponding author
- 6 E-mail address: <u>suxg@jlu.edu.cn</u>
- 7 *Tel.:* +86 431 85168352
- 8



11 Fig. S1 XPS analysis of the synthesized MPA-capped CuInS₂ QDs. (a) survey spectrum (b) Cu2p (c) In3d (d) S2p.



13 Fig. S2 A The TEM imaging of MPA-capped CuInS₂ QDs. B The UV-vis absorption spectra of MPA-capped

14 CuInS₂ QDs (Solid line) and F-CuInS₂ QDs (Dash line).



16 Fig. S3 The FT-IR spectra of the MPA-capped $CuInS_2QDs$ (curve a) and F-CuInS₂ QDs (curve b).



18 Fig. S4 1H NMR spectra of the reaction products of DCD and BD in the system (Incubation for 3 hours at pH 9.0).





20

Fig. S5 The fluorescence spectra of F-CuInS₂ QDs upon the addition of different concentration of DCD in the
range of 0 to 4 mmol/L (0, 0.005, 0.010, 0.025, 0.050, 0.20, 0.50, 0.75, 1.0, 1.25, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0 mmol/L)
in the presence of 2 mmol/L BD. Inset: the plot of fluorescence intensity ratios of F₀/F at 736 nm versus the



24 concentration of DCD from 0.005 to 2 mmol/L. PBS: 5 m mol/ L phosphate buffer solution (pH 9.0) at 25 °C.





31 Fig. S7 (A) The fluorescence intensity of F-CuInS₂ QDs with different concentration of DCD, BD or mixture of 4

 $\label{eq:mmoll} 32 \quad \text{mmoll} \ \text{BD} \ \text{and} \ \text{DCD}. \ (B) \ \text{The fluorescence intensity of MPA-capped CuIn} S_2 \ \text{QDs with different concentration of}$

- **33** DCD, BD or mixture of 4 mmol/L BD and DCD.
- 34

35



36

37 Fig.S8 1: The fluorescence intensity of F-CuInS₂ QDs. The fluorescence intensity of F-CuInS₂ QDs with 2 **38** mmol/L 2: DCD, 3: MA, 4: L-cysteine, 5: aspartic acid, 6: glutamic acid, 7: L-threoine, 8: glycine, 9: glucose, 10: **39** cyclodextrin, 11: acetylcholine, 12: carnitine, 13: phenylalanine, 14: galactose, 15: sucrose, 16:fructose, 17: **40** Fe²⁺(100 μ mol/L), 18: Fe³⁺(100 μ mol/L), 19: Cu²⁺(100 μ mol/L), 20: Hg²⁺(100 μ mol/L) 21: K⁺(2 mmol/L), 22: **41** Ca²⁺(2 mmol/L), 23: Mg²⁺ (2 mmol/L), 24: Zn²⁺(2 mmol/L). PBS: 5 m mol/ L phosphate buffer solution (pH **42** 9.0), BD: 4 mmol/L at 25°C.





Fig.S9 The fluorescence quenching ratios F/F₀ (F₀ is the original fluorescence intensity of F-CuInS₂ QDs, and F is
the fluorescence intensity of F-CuInS₂ QDs mixed with 4 mmol/L BD and different concentration of reactants for
3 hours) of the assay system in the presence of different concentration of DCD, acetonitrile, arginine and melamine

 $\label{eq:main_state} 47 \quad (MA). \ PBS: 5 \ m \ mol/ \ L \ phosphate \ buffer \ solution \ (pH \ 9.0)$

48

49