

## Nitrogen-doped Carbon Quantum Dots from Biomass as a FRET-based Sensing Platform for the Selective detection of H<sub>2</sub>O<sub>2</sub> and Aspartic Acid

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**Table S1:** Comparison of LOD of N-CQDs towards the detection of H<sub>2</sub>O<sub>2</sub>

S. No	Material	Limit of detection	Application	Ref.
1.	N-CQDs from Biomass	26.4 mM	H <sub>2</sub> O <sub>2</sub> sensing	This work
2.	Composite of N-CQDs and silver nanoparticles	4.7 μM	H <sub>2</sub> O <sub>2</sub> sensing	1
3.	Europium-doped GdVO <sub>4</sub> nanocrystals	1.6 μM	H <sub>2</sub> O <sub>2</sub> sensing	2
4.	CdSe@ZnS	0.3 μM	H <sub>2</sub> O <sub>2</sub> sensing	3
5.	Thiourea-functionalized graphene aerogel	2.42 μM	H <sub>2</sub> O <sub>2</sub> sensing	4
6.	Cu <sub>3</sub> [P <sub>2</sub> W <sub>18</sub> O <sub>62</sub> ] and HKUST-1 MOFs	0.17 μM	H <sub>2</sub> O <sub>2</sub> sensing	5

**Table S2:** Comparison of LOD of N-CQDs towards the detection of aspartic acid

S. No	Material	Limit of detection	Application	Ref.
1.	N- CQDs from mass	134.2 nM	Aspartic acid sensing	This work
2.	Cd-based metal organic frame works	152 nM	Aspartic acid	

			sensing	6
3.	imidazolium-modified cationic dansyl derivative (1)	600 nM	Aspartic acid sensing	7
4.	N-CQDs (Citric acid and urea as source of nitrogen and carbon)	90 nM	Aspartic acid sensing	8
5.	polythiophene–gold nanoparticles composite	32 nM	Aspartic acid sensing	9
6.	3-Methoxysalicylaldehyde thiosemicarbazone	87.4 nM	Aspartic acid sensing	10

### References:

1. L. S. Walekar, P. Hu, F. Liao, X. Guo and M. Long, *Microchimica Acta*, 2017, **185**, 31.
2. V. Muhr, M. Buchner, T. Hirsch, D. J. Jovanović, S. D. Dolić, M. D. Dramićanin and O. S. Wolfbeis, *Sensors and Actuators B: Chemical*, 2017, **241**, 349-356.
3. Z. Zhou, L. Yang, L. Huang, Y. Liao, Y. Liu and Q. Xiao, *Analytica Chimica Acta*, 2020, **1106**, 176-182.
4. J. Kaushik, Gunture, K. M. Tripathi, R. Singh and S. K. Sonkar, *Chemosphere*, 2022, **287**, 132105.
5. C. Shi, S. Di, H. Jiang, C. Wang, C. Wang, K. Yu, J. Lv and B. Zhou, *Dalton Transactions*, 2023, **52**, 9406-9413.
6. T. Gao, L. Gao, J. Zhang, W. Zhou, Z. Zhang, X. Niu and T. Hu, *Journal of Luminescence*, 2021, **231**, 117798.
7. Y. Zhang, J. Cao and L. Ding, *Journal of Photochemistry and Photobiology A: Chemistry*, 2017, **333**, 56-62.
8. R. Tabaraki and O. Abdi, *Journal of Fluorescence*, 2019, **29**, 751-756.
9. H. Guan, P. Zhou, X. Zhou and Z. He, *Talanta*, 2008, **77**, 319-324.
10. M. Ranjani, P. Kalaivani, F. Dallemer, S. Selvakumar, T. Kalpana and R. Prabhakaran, *Inorganica Chimica Acta*, 2022, **530**, 120683.

