

# Plasmonic Nano Silver: An Efficient Colorimetric Sensor for the Selective Detection of Hg<sup>2+</sup> Ions in Real Samples

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## Table Caption

**Table S1.** Comparison of different methods using nanoparticles as a sensing probe for Hg<sup>2+</sup> determination.

S. No	Technique	Limit of detection(ppm)	Comments	Reference
1	Fluorometric sensing	0.2	Complicated sensing protocols	1
2	Microfluidic platform	0.19	Complex synthesis of highly sensitive probe	2
3	Fluorescence	0.58	Complicated synthesis process	3
4	Colorimetric Assay	0.2	Simple, low cost, quick and robust	Current study

## References

- Wang, X.; Su, Y.; Yang, H.; Dong, Z.; Ma, J. Highly sensitive fluorescence probe based on chitosan nanoparticle for selective detection of Hg<sup>2+</sup> in water. *Colloids Surf. A Physicochem. Eng. Asp.* **2012**, *402*, 88–93.
- Davadhasan, J.P.; Kim, J. A chemically functionalized paper-based microfluidic platform for multiplex heavy metal detection. *Sens. Actuator B Chem.* **2018**, *10*, 18–24.
- Chen, M.-M.; Chen, L.; Li, H.-X.; Brammer, L.; Lang, J.-P. Highly selective detection of Hg<sup>2+</sup> and MeHgI by di-pyridin-2-yl-[4-(2-pyridin-4-yl-vinyl)-phenyl]-amine and its zinc coordination polymer. *Inorg. Chem. Front.* **2016**, *3*, 1297–1305.