

Supporting information

Significant Chemiluminescence Enhancement by Tannic Acid Functionalised Plasmonic Silver Nanoparticles

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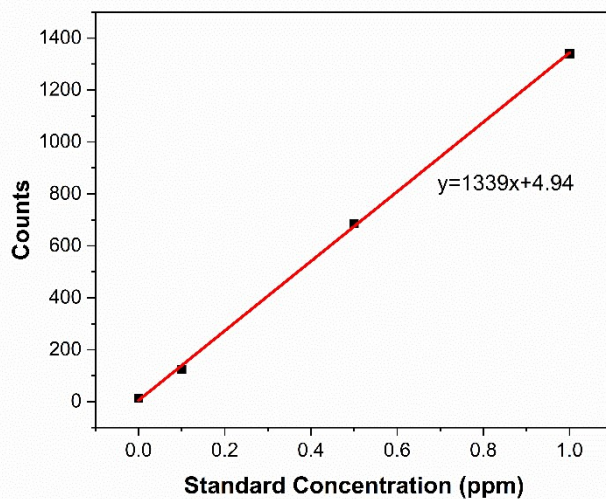


Fig. S1: The ICP-OES calibration curve for Ag ions.

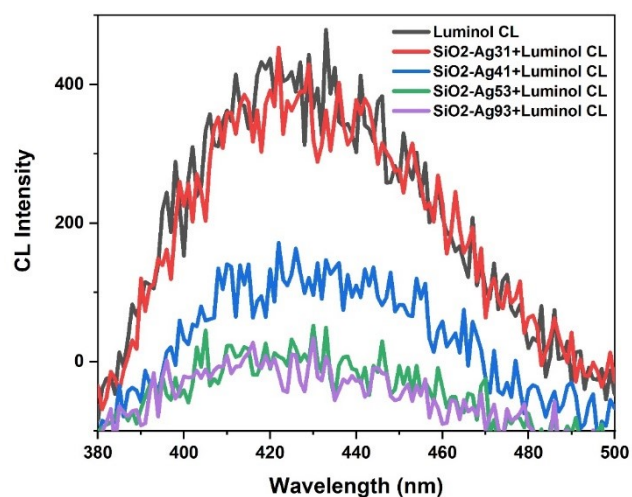


Fig S2: The chemiluminescence spectrum of luminol- H_2O_2 incorporated by silica coated Ag NPs. The silica coatings are 25-35 nm in thickness, which isolates the Ag ion diffusion. The thickness is also too thick as a spacer for plasmonic enhancement, thus, the chemiluminescence test shows quenching for all four Ag sizes.

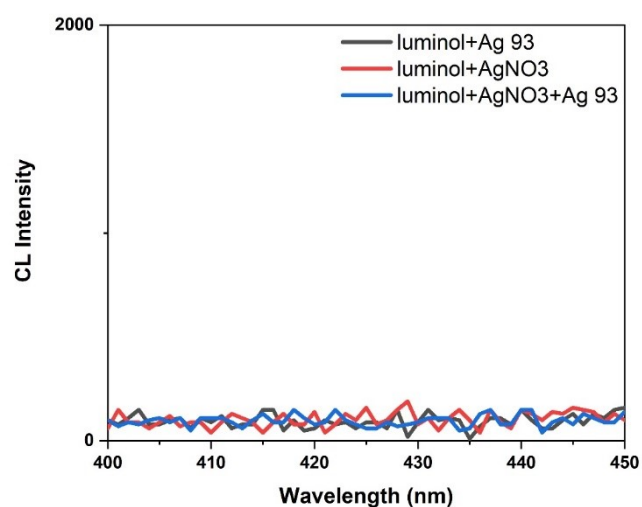


Fig. S3: The chemiluminescence spectrum of luminol incorporated by Ag NPs and AgNO_3 . There is a redox reaction taking place between luminol and AgNO_3 very slowly. The addition of Ag 93 does not catalyse this process. Therefore, no chemiluminescence signal was measured.

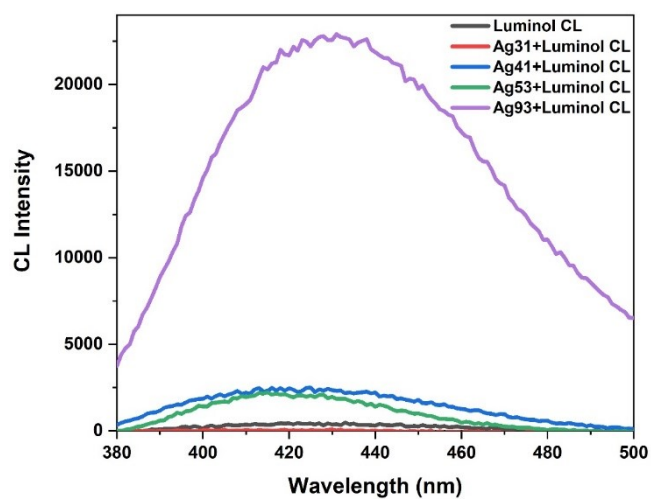


Fig. S4: The chemiluminescence spectrum of luminol-H₂O₂ incorporated by TA-Ag 31-93. The total surface area of TA-Ag 31-93 is the same in each CL test. The result shows that TA-Ag 93 still ranks first in chemiluminescent enhancement.

Table S1: Calculation of number density for TA-Ag 31-93 from ICP-OES results:

	Total Mass (mg/L)	Density of Ag (mg/nm³)	Volume of one Ag NP (nm³)	Mass of a single Ag NP (mg)	No. density of Ag NPs (NPs/L)
TA-Ag 31	0.94	1.049×10^{-17}	1.56×10^4	1.63×10^{-13}	5.72×10^{12}
TA-Ag 41	1.24	1.049×10^{-17}	3.61×10^4	3.79×10^{-13}	3.26×10^{12}
TA-Ag 53	1.61	1.049×10^{-17}	7.80×10^4	8.18×10^{-13}	1.97×10^{12}
TA-Ag 93	1.66	1.049×10^{-17}	4.21×10^5	4.42×10^{-12}	3.76×10^{11}

Table S2: Calculation of total surface area density for TA-Ag 31-91 from ICP-OES results.

	Surface area of a single Ag NP (nm²)	No. density of Ag NPs (NPs/L)	Total surface area (nm²/L)
TA-Ag 31	3.04×10^3	5.72×10^{12}	1.74×10^{16}
TA-Ag 41	5.25×10^3	3.26×10^{12}	1.71×10^{16}
TA-Ag 53	8.86×10^3	1.97×10^{12}	1.75×10^{16}
TA-Ag 93	2.71×10^4	3.76×10^{11}	1.02×10^{16}