

Electronic Supplementary Information (ESI)

Simple Photothermal Paper-Based Analytical Device Using Silver Nanomaterials for Quantitative Mercury Ion Monitoring in Drinking Water and Wolffia Samples

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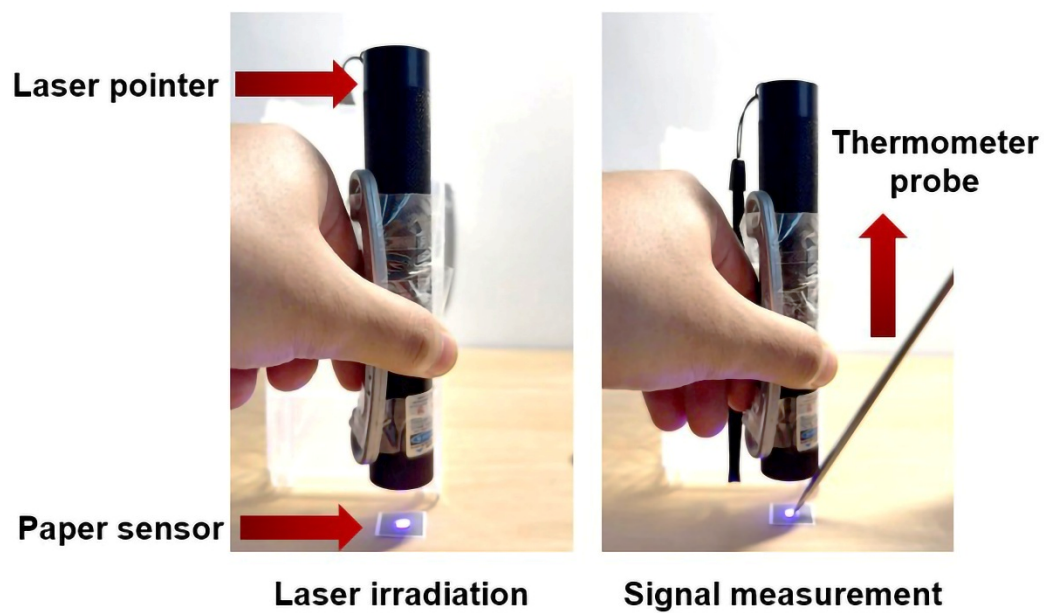
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Scheme S1 Photograph of the experimental setup of the developed PT-PAD sensor for Hg^{2+} detection in this study.

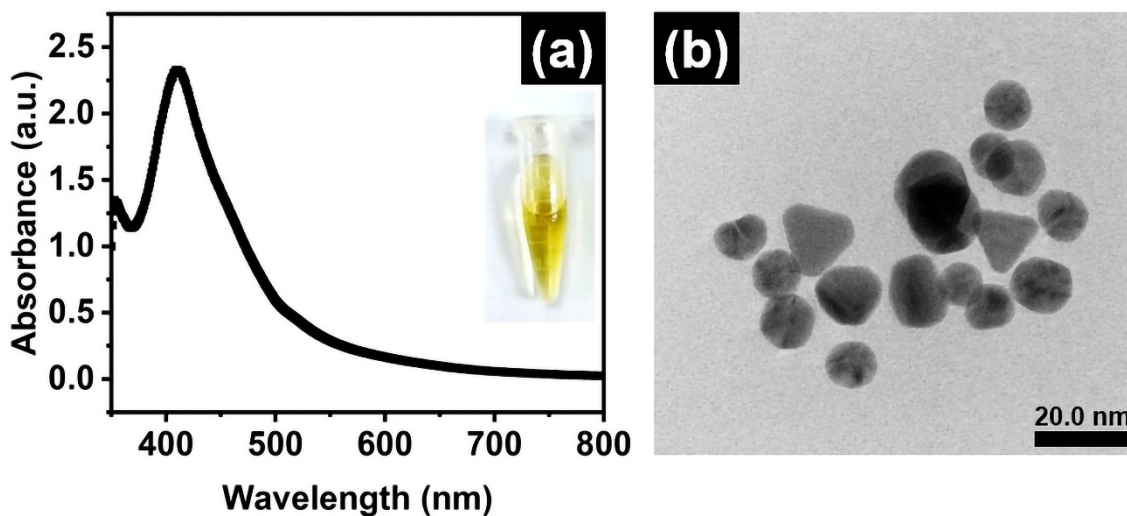


Figure S1 (a) The absorption spectrum and (b) the TEM image of the synthesized AgNPs used in the developed PT-PAD sensor for Hg^{2+} detection in this work.

In this study, a dominant absorption peak at 410.0 nm, accompanied by a dark-yellow solution, was observed for the synthesized AgNPs, as shown in **Figure S1(a)**. Additionally, in **Figure S1(b)**, the TEM image displayed the particles with a size of 8.0 ± 2.0 nm. These results thus demonstrate the successful synthesis of AgNPs using the developed technique.

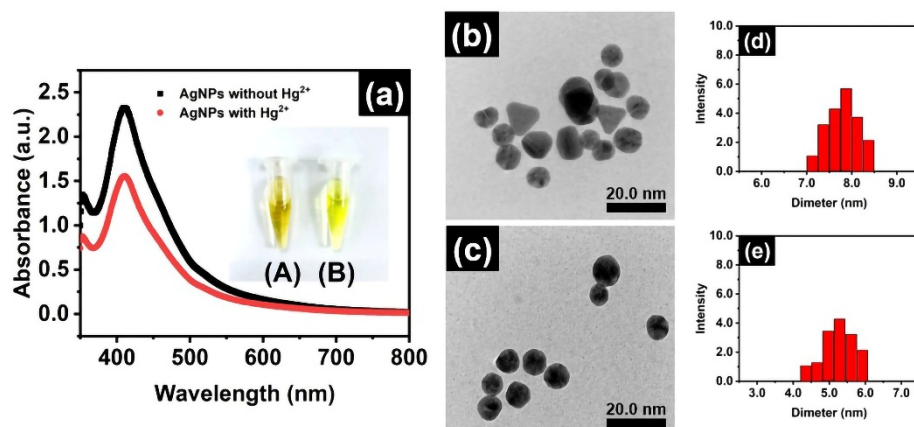


Figure S2 (a) The absorption spectrum of the synthesized AgNPs (black line) and the synthesized AgNPs with addition of Hg^{2+} at 6.0 ppb (red line). The inserted images indicate the synthesized AgNPs in the absent (A) and present (B) of Hg^{2+} . The TEM image of the synthesized AgNPs in the absent (b) and present (c) of Hg^{2+} . The DLS measurement of the synthesized AgNPs in the absent (d) and present (e) of Hg^{2+} .

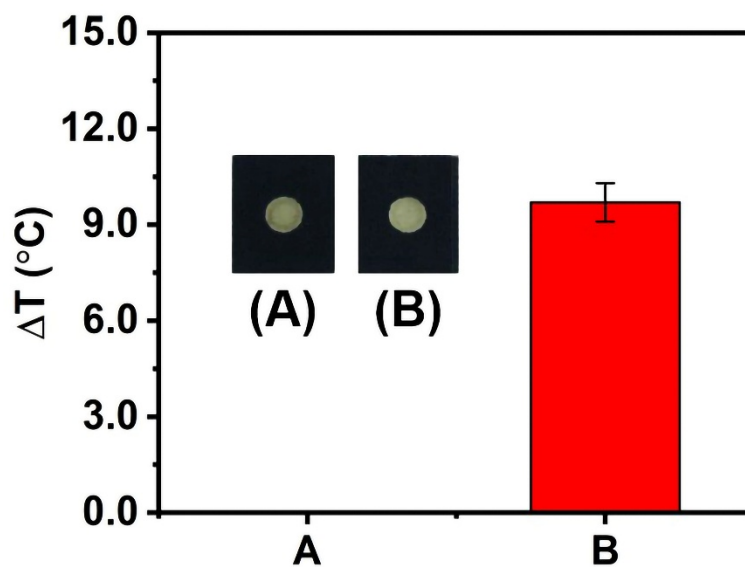


Figure S3 Demonstrates the ΔT signals of the detection of (A) blank solution and (B) Hg^{2+} at 6.0 ppb using the PT-PAD sensor ($n = 3$).

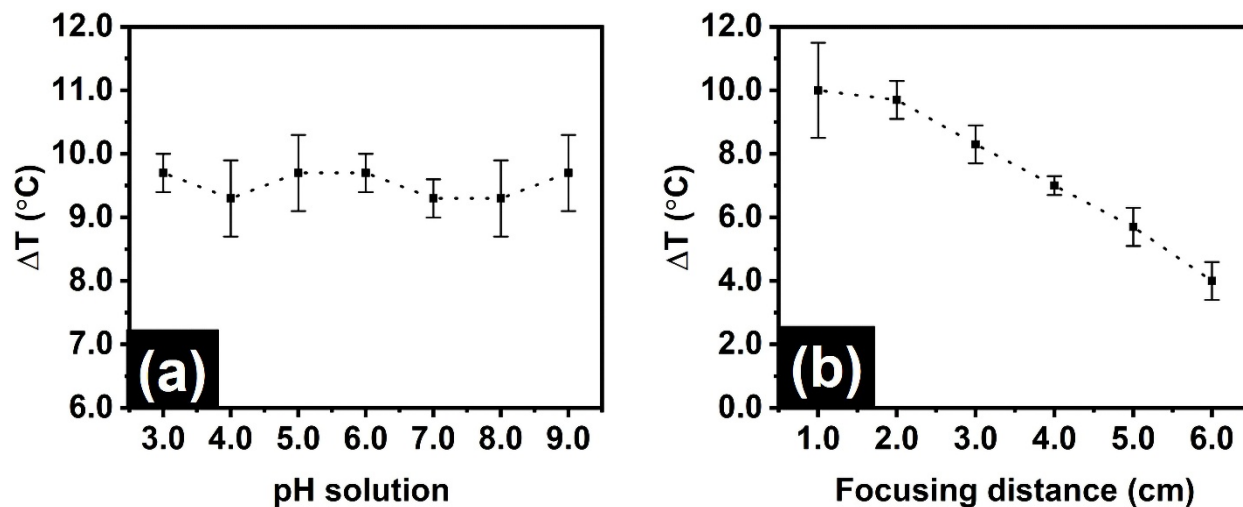


Figure S4 Demonstrates the ΔT signals of the (a) pH solution and (b) focusing distance between laser and PAD sensor for the detection of Hg^{2+} using the developed PT-PAD sensor ($n = 3$).

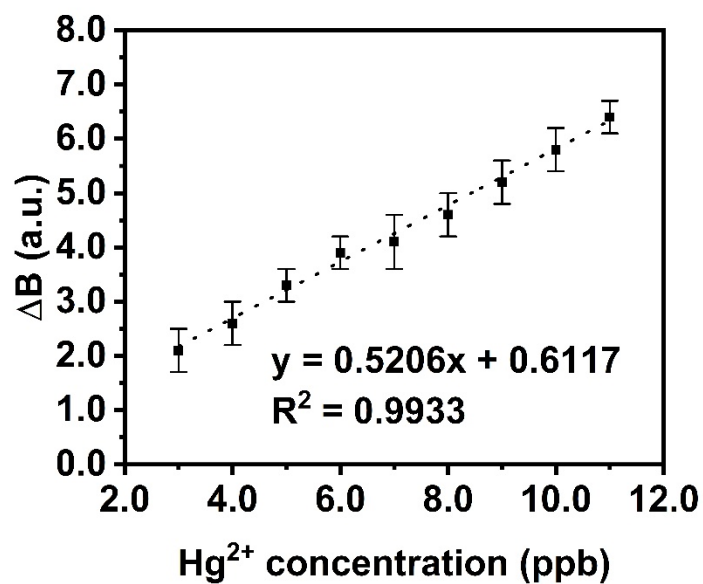


Figure S5 The linear range of the Hg^{2+} quantification using the proposed method with the colorimetric detection ($n = 3$).

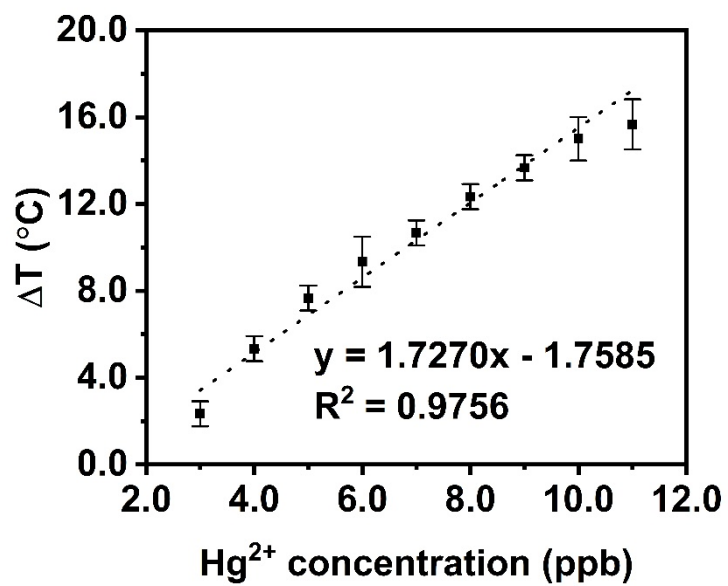


Figure S6 Demonstrates the ΔT signal for linear working range of Hg^{2+} detection with non-logarithm scale in analyte concentration ($n = 3$).

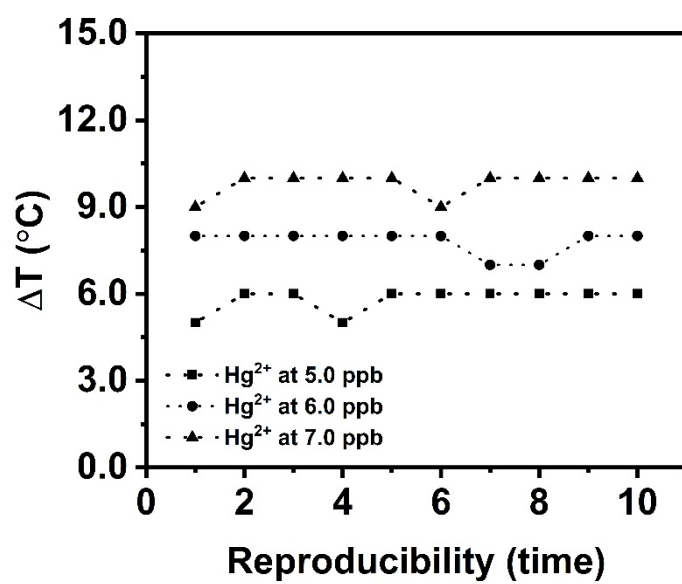


Figure S7 Demonstrates the ΔT signals of the reproducibility of the proposed method for the detection of Hg^{2+} at (■) 5.0, (●) 6.0, and (▲) 7.0 ppb.

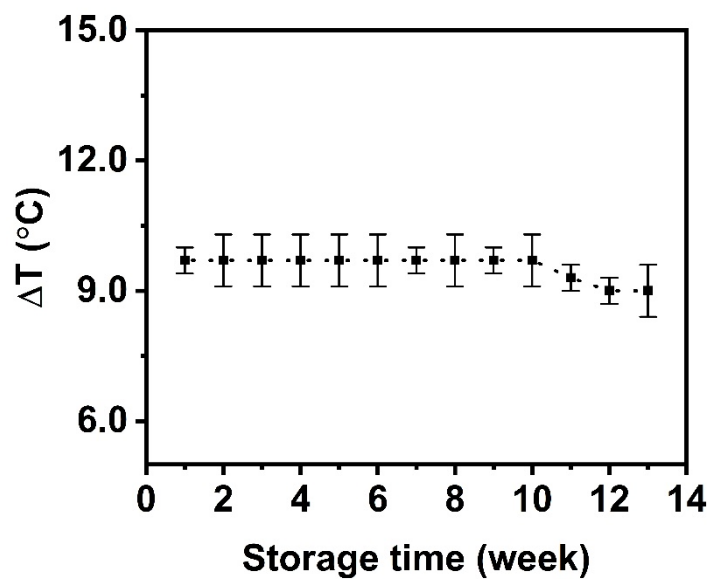


Figure S8 Demonstrates the ΔT signals of storage time evaluation of the developed PT-PAD sensor for Hg^{2+} detection at 6.0 ppb ($n = 3$).