# Electronic Supplementary Information

## Dual-Emission Nitrogen-Doped Carbon Dots for Ratiometric and Smartphone-Based Detection of Levofloxacin

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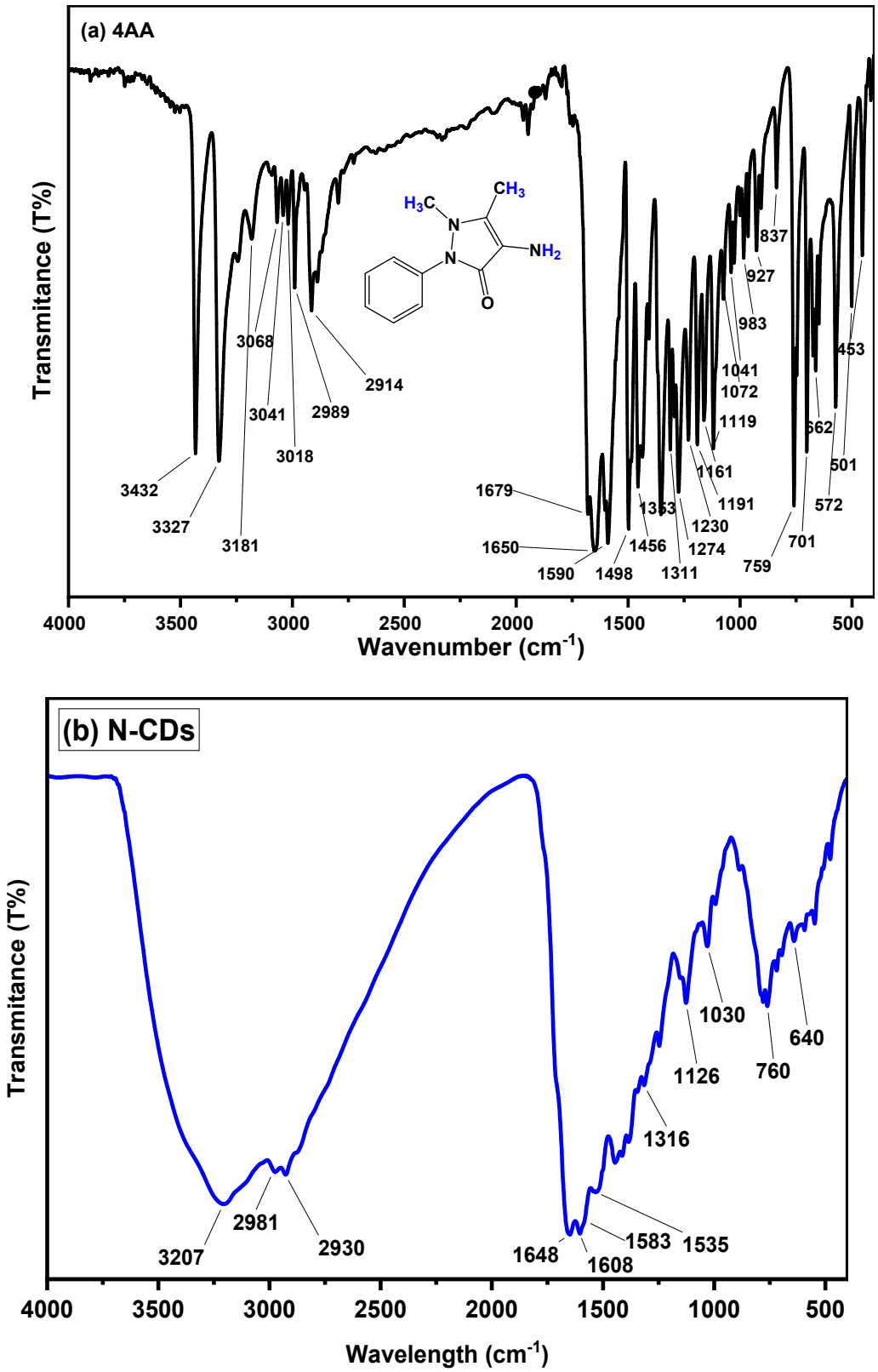


**Fig. S1** FT-IR spectra of **(a)** 4AA, and **(b)** N-CDs.

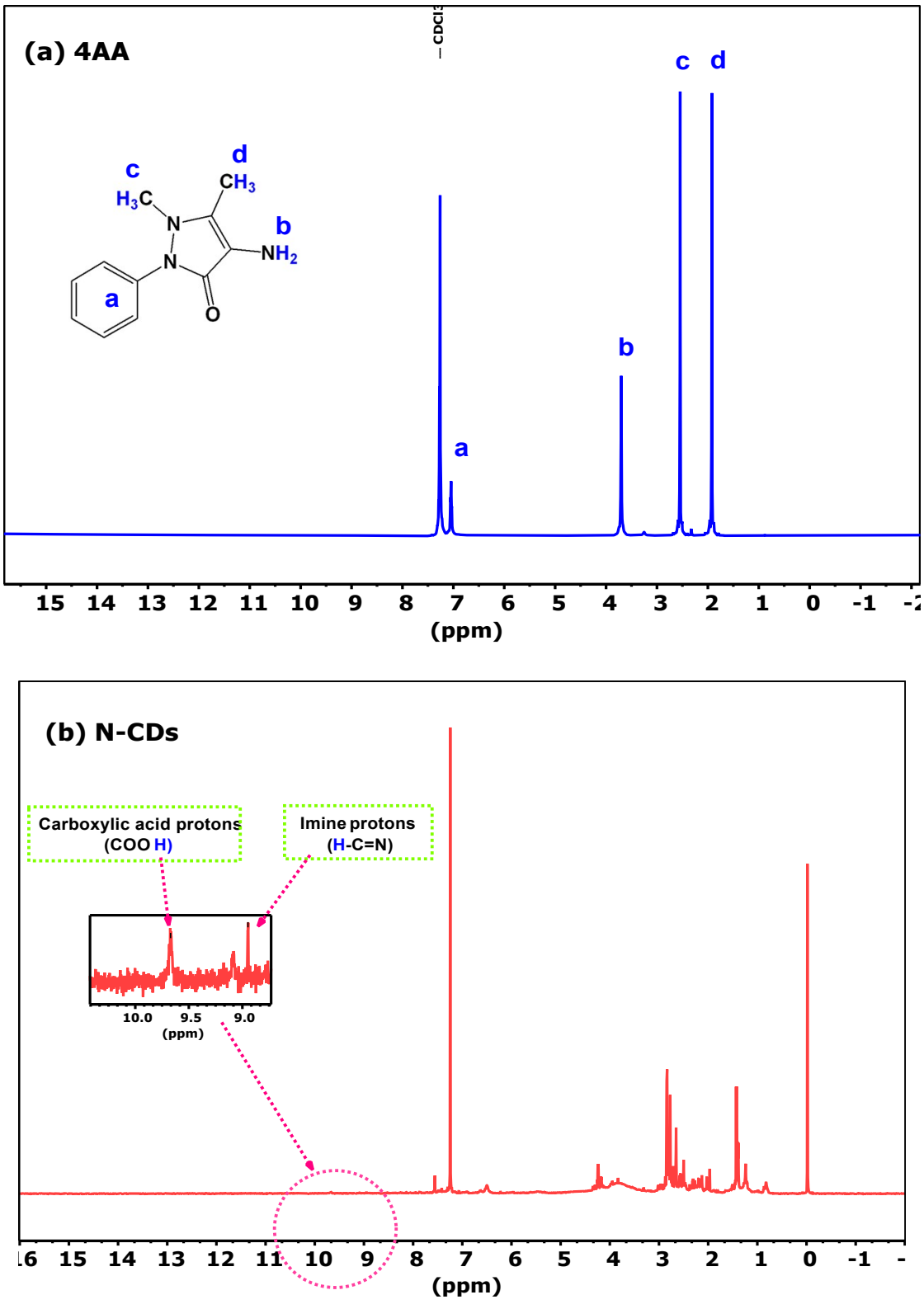


**Fig. S2** $^{1}$H-NMR spectra of **(a)** 4AA, and **(b)** N-CDs.

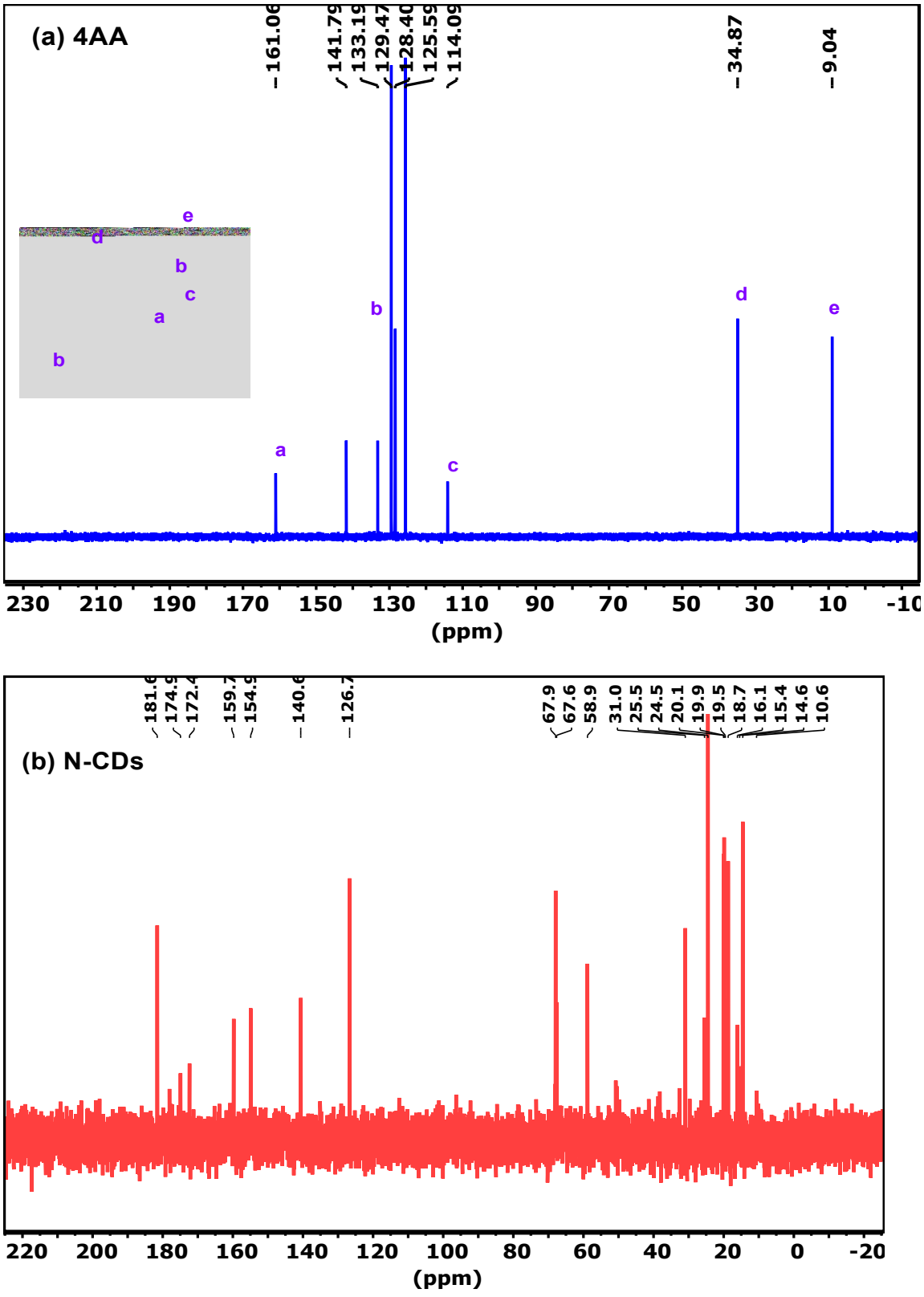


**Fig. S3** $^{13}$C-NMR spectra of **(a)** 4AA, and **(b)** N-CDs.

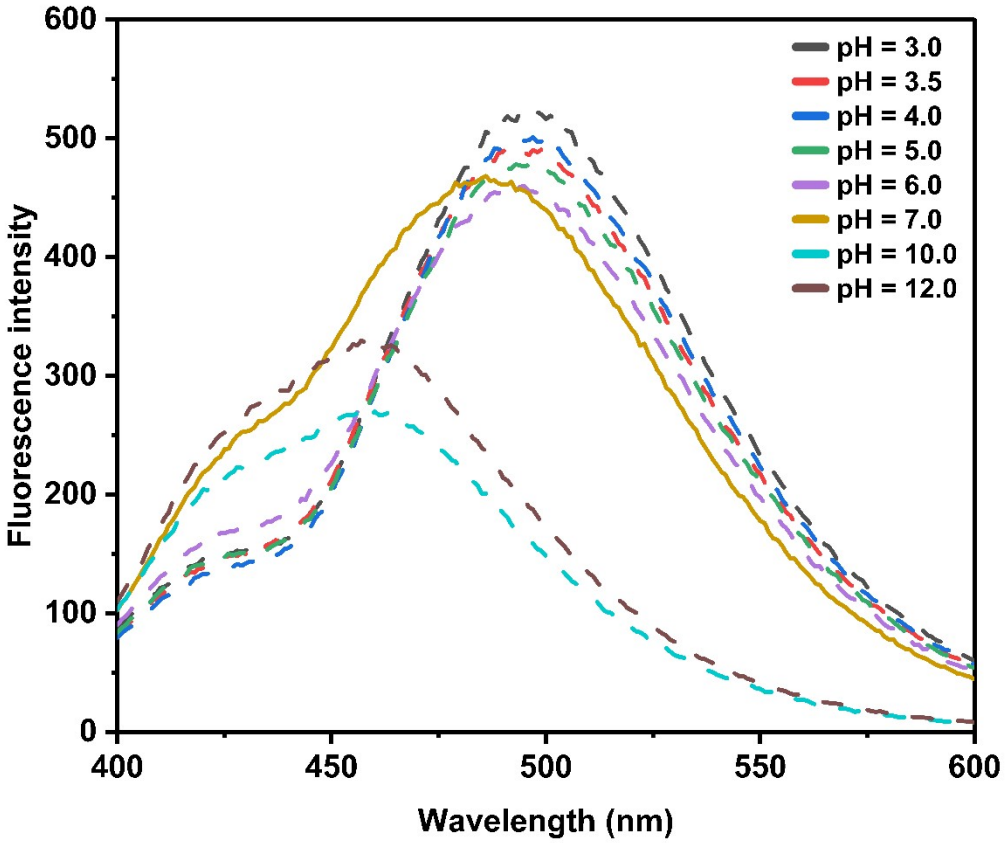


**Fig. S4** The fluorescence intensity of N-CDs and LEV solutions at pH levels ranging from 3 to 12 with different buffer solutions.

## 5. Quantitative XPS Analysis

The quantification of functional groups on the surface of the N-CDs was carried out through XPS analysis. The elemental atomic percentages were first obtained from the wide survey spectrum using the corresponding relative sensitivity factors (RSFs) for each element. The corrected atomic percentage of a given element *i* was calculated according to:

$$Atomic\%\ of\ component\ (i) = \frac{\frac{Area(i)}{RSF(i)}}{\sum \frac{Area(j)}{RSF(j)}} \times 100$$

where Area(*i*) is the integrated peak area of the element *i* in the survey spectrum, and RSF(*i*) is its relative sensitivity factor. The denominator represents the sum of all corrected peak areas for the detected elements. The elemental composition of the N-CDs determined from the XPS survey spectrum is provided in **Table S1**.

**Table S1.** Elemental composition of the N-CDs obtained from XPS survey spectra.

| Name | Peak Area (CPS. eV) | Sensitivity Factor (SF) | Atomic% after SF correction |
|---|---|---|---|
| **C 1s** | 34341.7 | 1.000 | 67.35 |
| **N 1s** | 18079.1 | 1.676 | 23.21 |
| **O 1s** | 13386.3 | 2.881 | 9.45 |

These normalized atomic percentages were then used to deconvolute the high-resolution spectra (C 1s, N 1s, O 1s). The fractional contribution ($f_i$) of each chemical component within a given element was calculated as:

$$f_i = \frac{A_i^{HR}}{\sum A_j^{HR}}$$

where $A_i^{HR}$ represents the background-corrected peak area of component *i*.

To express the abundance of functional groups as a percentage of the overall surface composition (as reported in Table 1 of the main article), the survey-level atomic percentage (At.%) was combined with the high-resolution fractions according to:

$$Group\%\ (i) = At.\%(i)\ \times\ f_i$$

**Table. S2** Determination and recovery of LEV in three commercial LEV tablets using a ratiometric fluorescence method.

| Tablet | Spiked (µM) | Average Found (µM) | Std. dv | Spike recovery (%) |
|---|---|---|---|---|
| **Pioneer** | 0 | 0.029 | 0.123 | |
| | 4 | 4.050 | 0.198 | 100.51 |
| | 8 | 7.099 | 0.426 | 88.36 |
| **Mascot** | 0 | -0.056 | 0.587 | |
| | 4 | 3.569 | 0.553 | 90.62 |
| | 8 | 6.908 | 0.463 | 87.06 |
| **Aristo** | 0 | 0.514 | 0.593 | |
| | 4 | 3.475 | 0.150 | 85.04 |
| | 8 | 7.346 | 0.471 | 85.40 |

**Table. S3** Determination and recovery of LEV in three commercial LEV tablets using a smartphone-based platform method.

| Tablet | Spiked (µM) | Average Found (µM) | Std. dv | Spike recovery (%) |
|---|---|---|---|---|
| **Pioneer** | 0 | -0.117 | 0.072 | |
| | 4 | 3.415 | 0.166 | 88.38 |
| | 8 | 7.325 | 0.259 | 93.06 |
| **Mascot** | 0 | 0.580 | 0.136 | |
| | 4 | 4.312 | 0.317 | 93.31 |
| | 8 | 7.347 | 0.436 | 84.58 |
| **Aristo** | 0 | 0.137 | 0.095 | |
| | 4 | 3.903 | 0.0718 | 94.07 |
| | 8 | 7.269 | 0.273 | 89.12 |