Electronic Supplementary Material (ESI) for New Journal of Chemistry.


Supporting Information

# Identifying Molecular Fluorophore Impurities in the Synthesis of Low-Oxygen-Content, Carbon Nanodots Derived from Pyrene

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**Table S1.** Time-correlated single-photon-counting (TCSPC) decay parameters determined for $F_Y$, $F_G$ and $F_{CND}$.

| **$F_Y$** | | **$F_G$** | | **$F_{CND}$** | |
|---|---|---|---|---|---|
| Excitation - 455 nm, Emission - 584 nm | | Excitation - 455 nm, Emission - 515 nm | | Excitation - 455 nm, Emission - 532 nm | |
| **Chi sq.** | 1.170382 | **Chi sq.** | 1.124855 | **Chi sq.** | 1.042829 |
| **$\tau_1$** | 8.91 ns | **$\tau_1$** | 3.19 ns | **$\tau_1$** | 1.13 ns |
| | | % $\tau_1$ | 15.25 % | **% $\tau_1$** | 11.03 % |
| | | **$\tau_2$** | 5.62 ns | **$\tau_2$** | 3.75 ns |
| | | % $\tau_2$ | 84.75 % | **% $\tau_2$** | 47.54 % |
| | | | | **$\tau_3$** | 8.80 ns |
| | | | | **% $\tau_3$** | 41.43 % |

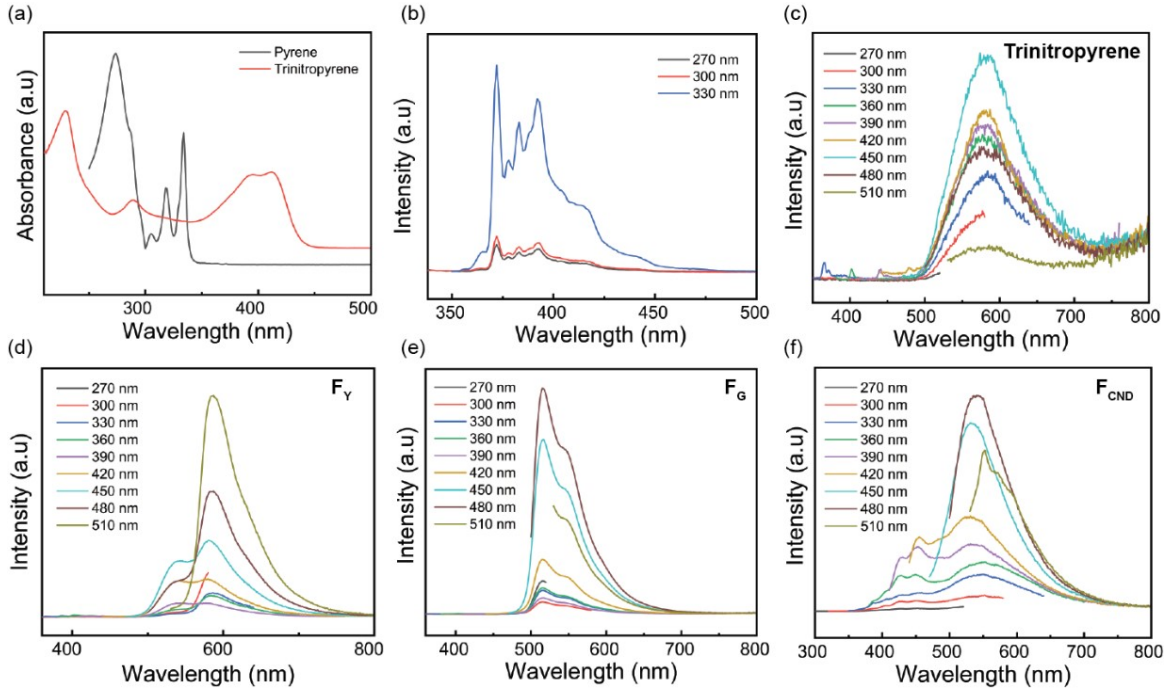



**Figure S1.** (a) UV-VIS absorbance spectra of pyrene and TNP in MeOH, PL spectra of (b) pyrene and (c) TNP in MeOH, PL spectra of fractions (d) $F_Y$, (c) $F_G$, and (d) $F_{CND}$ in MeOH.

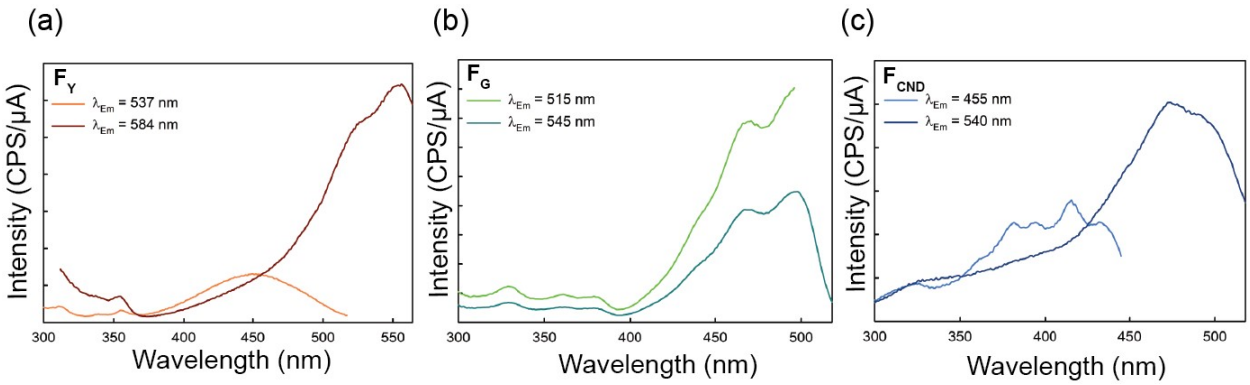



**Figure S2.** PLE spectra of the fractions (a) $F_Y$, (b) $F_G$, and (c) $F_{CND}$ in MeOH.

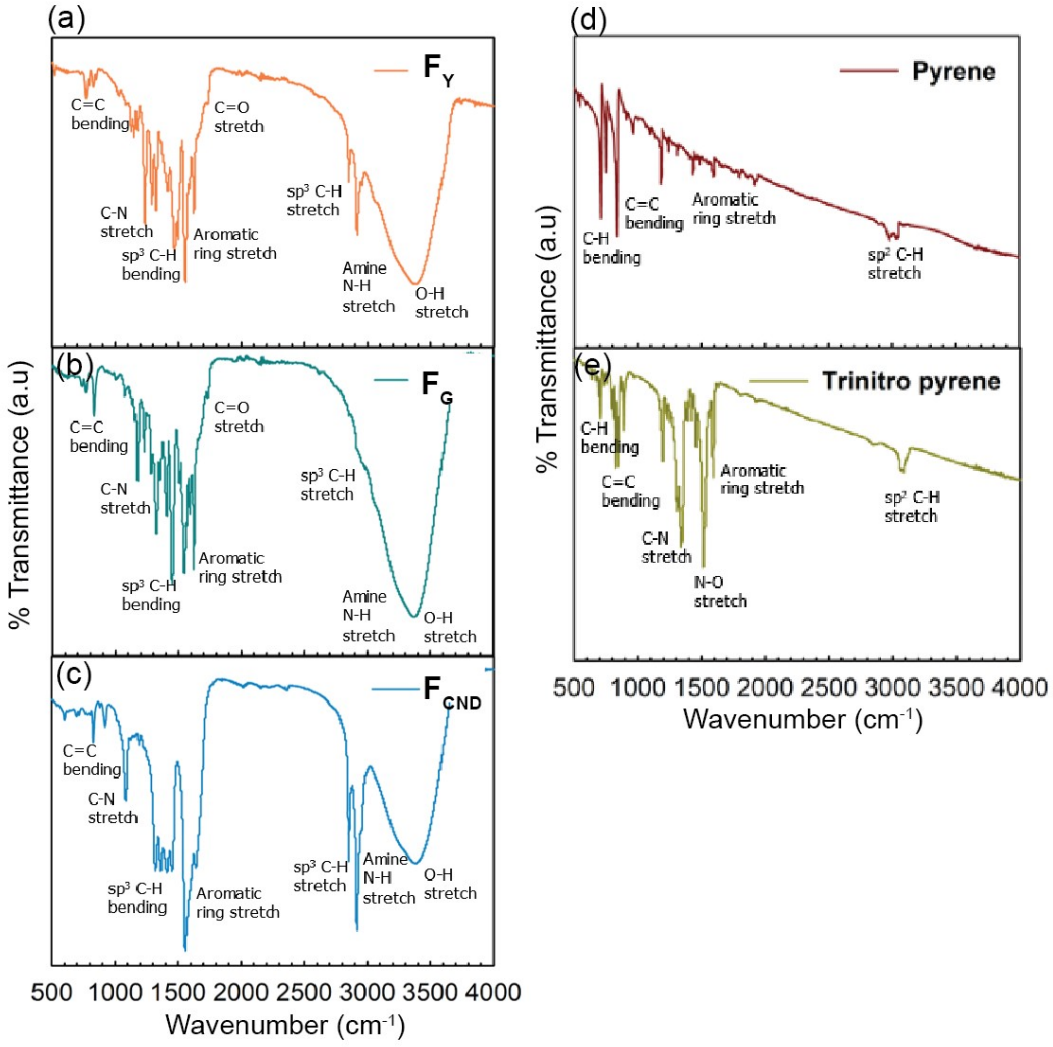



**Figure S3.** (a-c) FT-IR spectra of the fractions (a) $F_Y$, (b) $F_G$, (c) $F_{CND}$ , (d) pyrene and (e) TNP

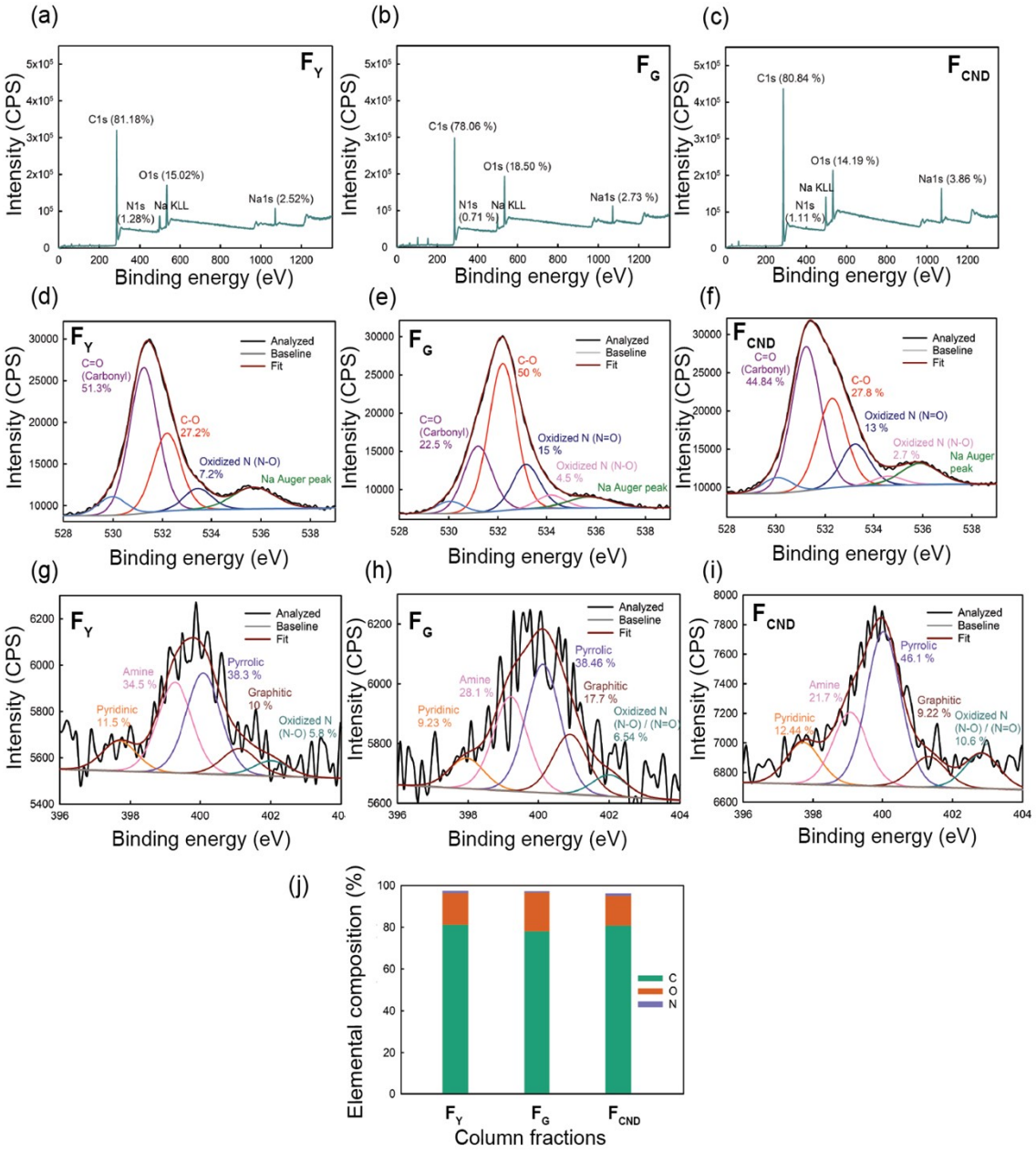
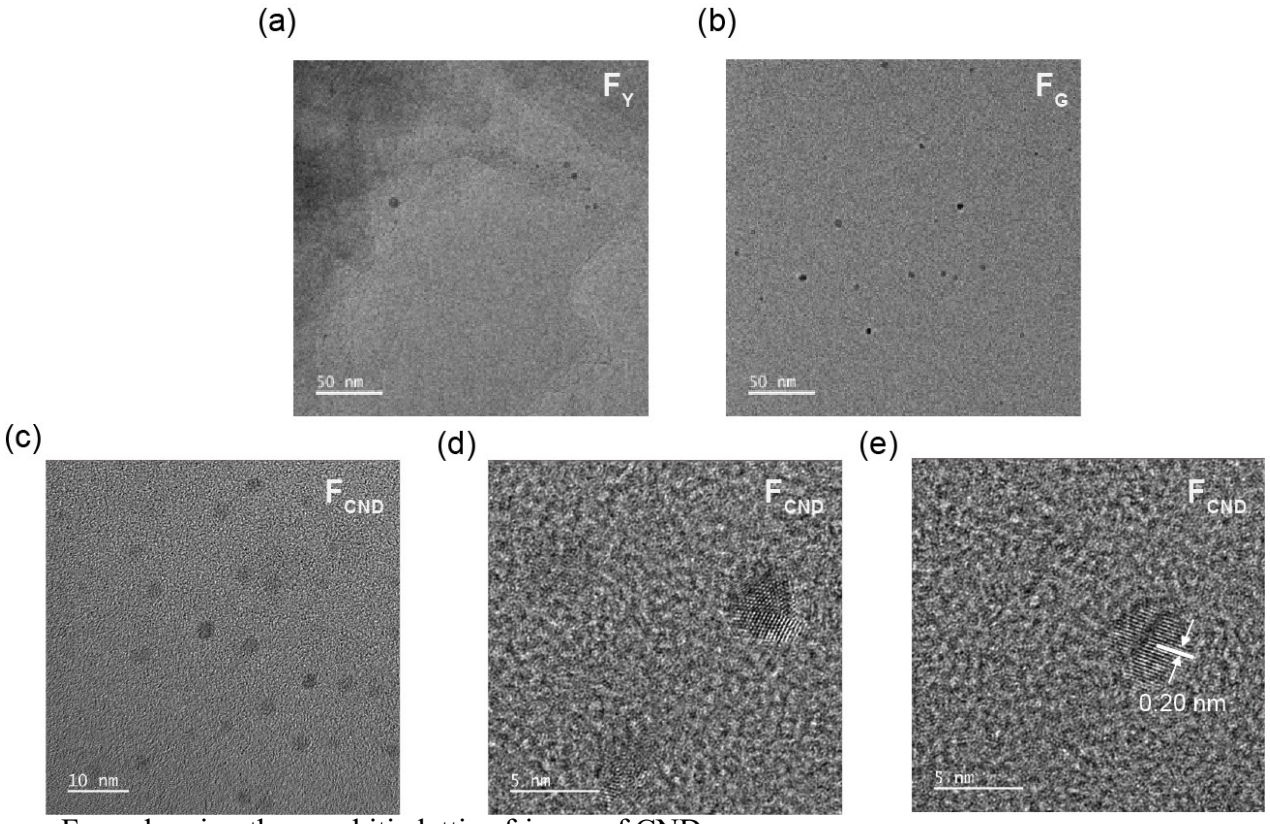



**Figure S4.** XPS survey spectra of (a) $F_Y$, (b) $F_G$, and (c) $F_{CND}$. Deconvoluted high-resolution O1s XPS spectra of (d) $F_Y$, (e) $F_G$, and (f) $F_{CND}$. Deconvoluted high resolution N1s XPS spectra of (g) $F_Y$, (h) $F_G$, and (i) $F_{CND}$. (j) the percentages of C, O, and N for each fraction determined from XPS analysis.

**Figure S5.** TEM images of (a) $F_Y$, (b) $F_G$, and (c) $F_{CND}$. (d-e) High-resolution TEM images of




$F_{CND}$ showing the graphitic lattice fringes of CNDs.

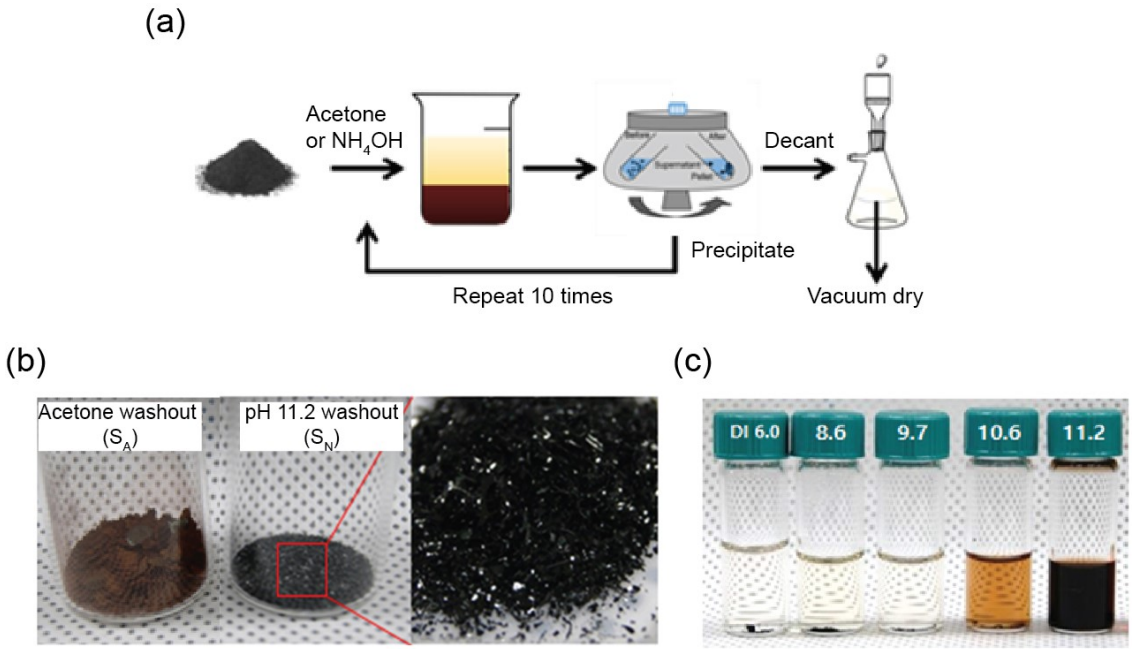


**Figure S6.** (a) A schematic of a procedure to obtain acetone wash-out ($S_A$) and the base wash-out (pH 11.2, ammonia) ($S_N$), (b) photographs of the acetone washout ($S_A$) and the base washout ($S_N$), (c) photographs of crude sample solutions at various pH

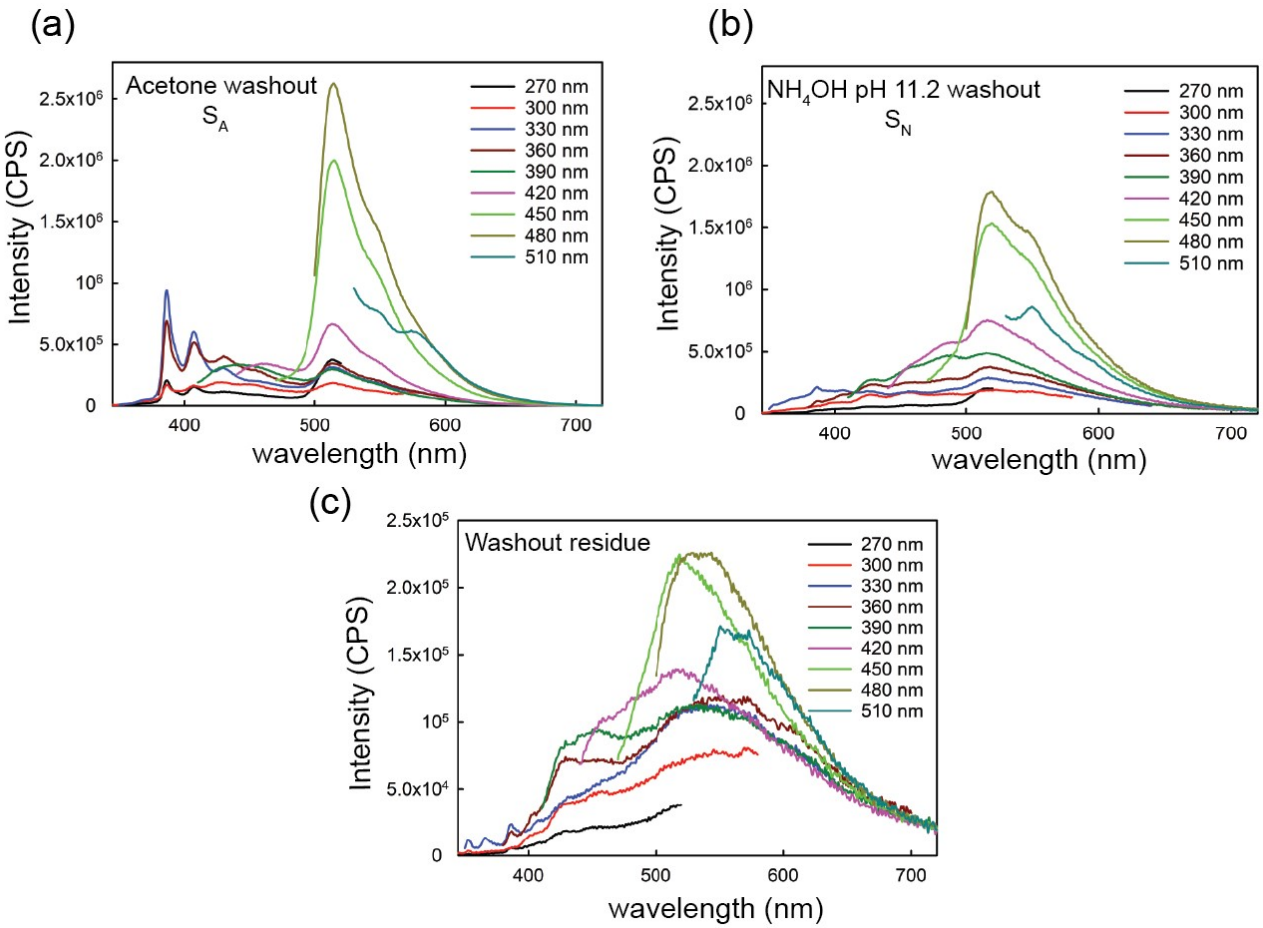



**Figure S7.** PL spectra of (a) the acetone washout ($S_A$), base washout (pH = 11.2) ($S_N$), and (c) the residue left after both washouts