

**Tunable-emission and AIPE-active heteroleptic Ir(III) complexes for
fingerprint detection *via* a spraying technique**

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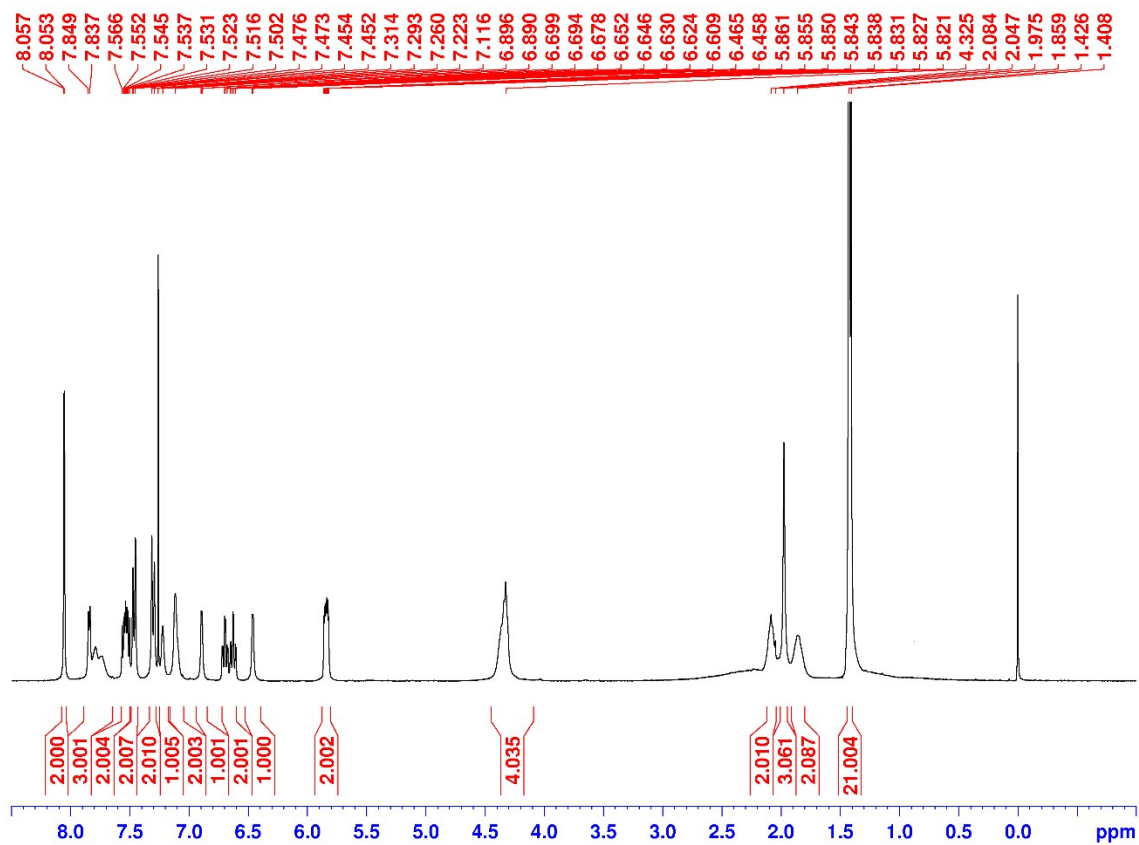


Fig. S1 ^1H NMR spectrum of **1** in CDCl_3 .

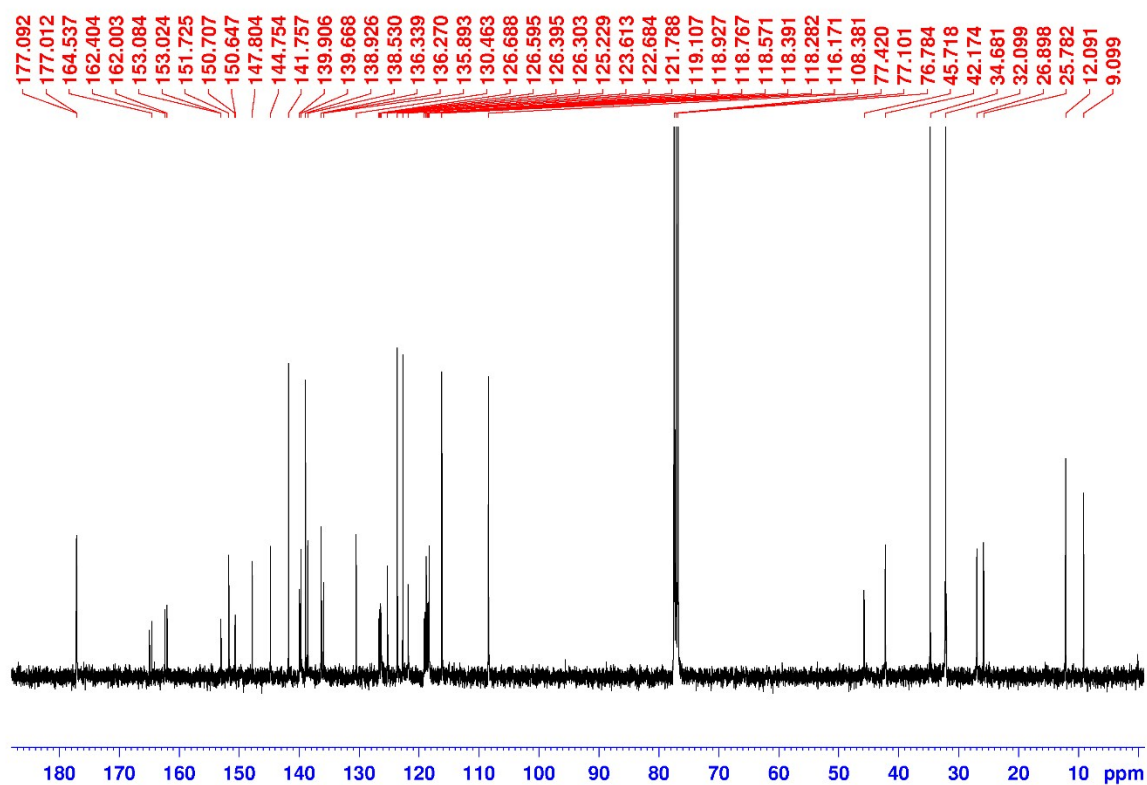


Fig. S2 ^{13}C NMR spectrum of **1** in CDCl_3 .

205 #17 RT: 0.22 AV: 1 NL: 3.51E8
T: FTMS + p ESI Full ms [150.00-2000.00]

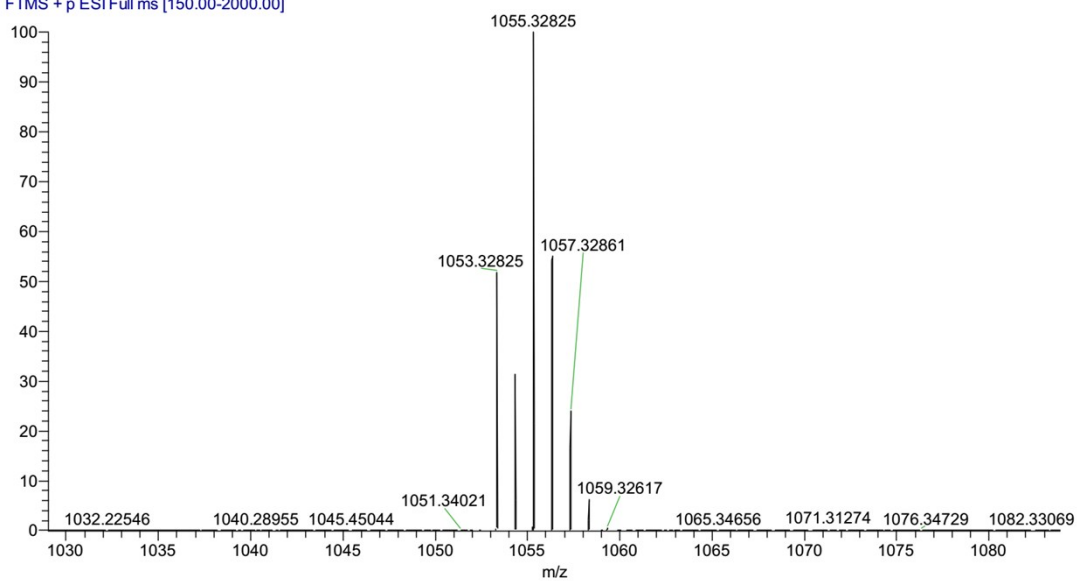


Fig. S3 HRMS (ESI-TOF) spectrum of 1.

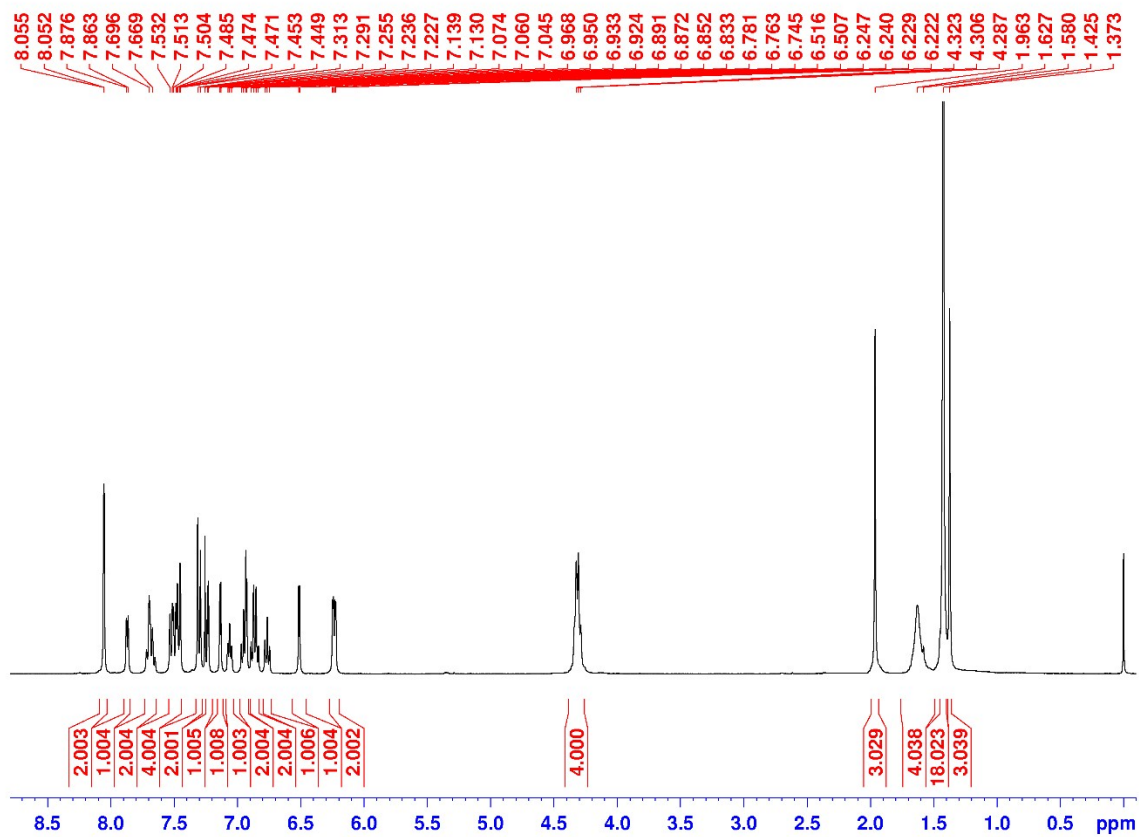


Fig. S4 ¹H NMR spectrum of 2 in CDCl₃.

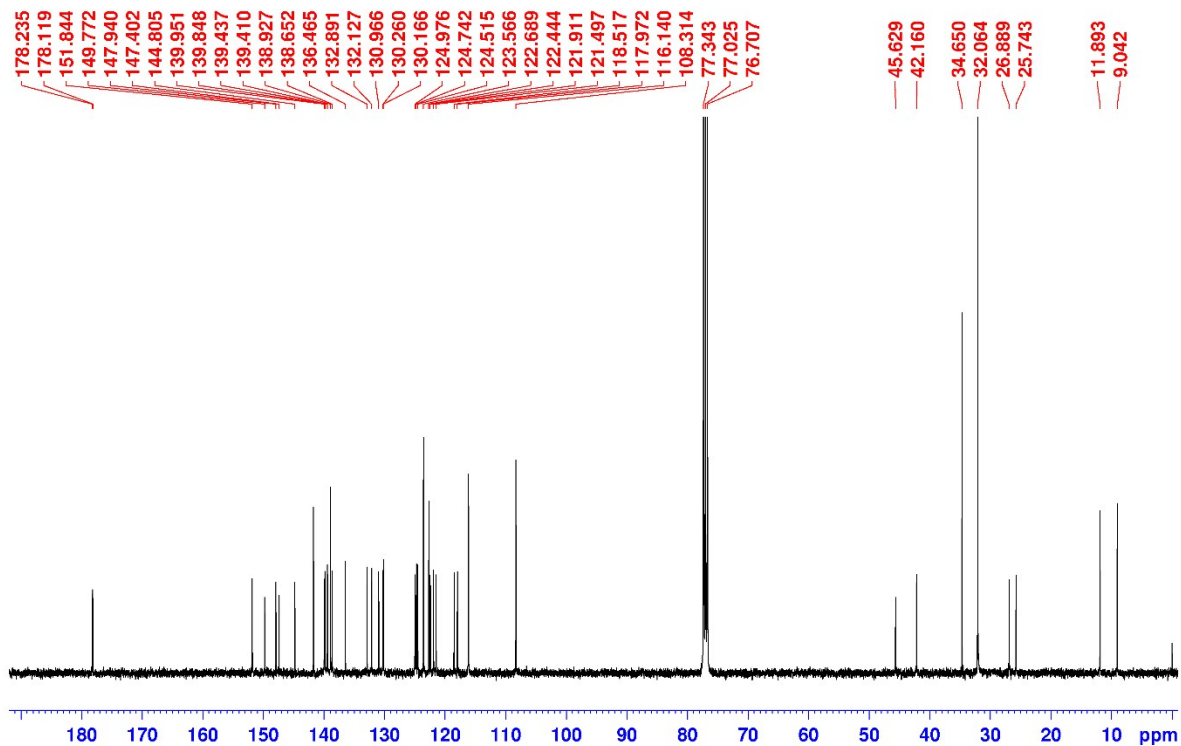


Fig. S5 ^{13}C NMR spectrum of **2** in CDCl_3 .

206 #14 RT: 0.18 AV: 1 NL: 1.52E8
T: FTMS + p ESI Full ms [150.00-2000.00]

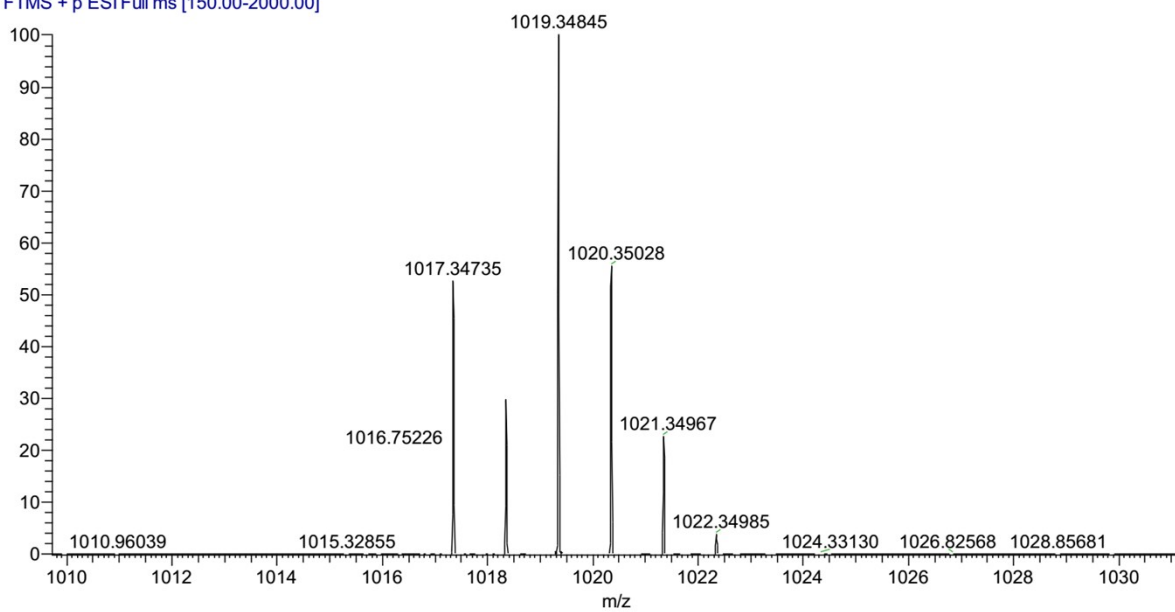


Fig. S6 HRMS (ESI-TOF) spectrum of **2**.

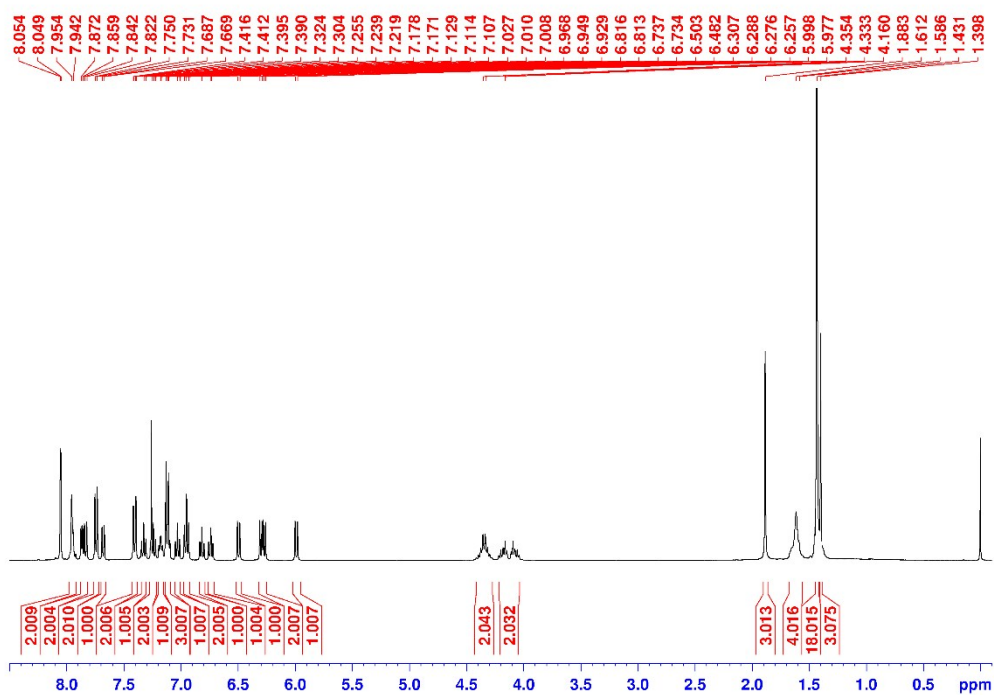


Fig. S7 ^1H NMR spectrum of **3** in CDCl_3 .

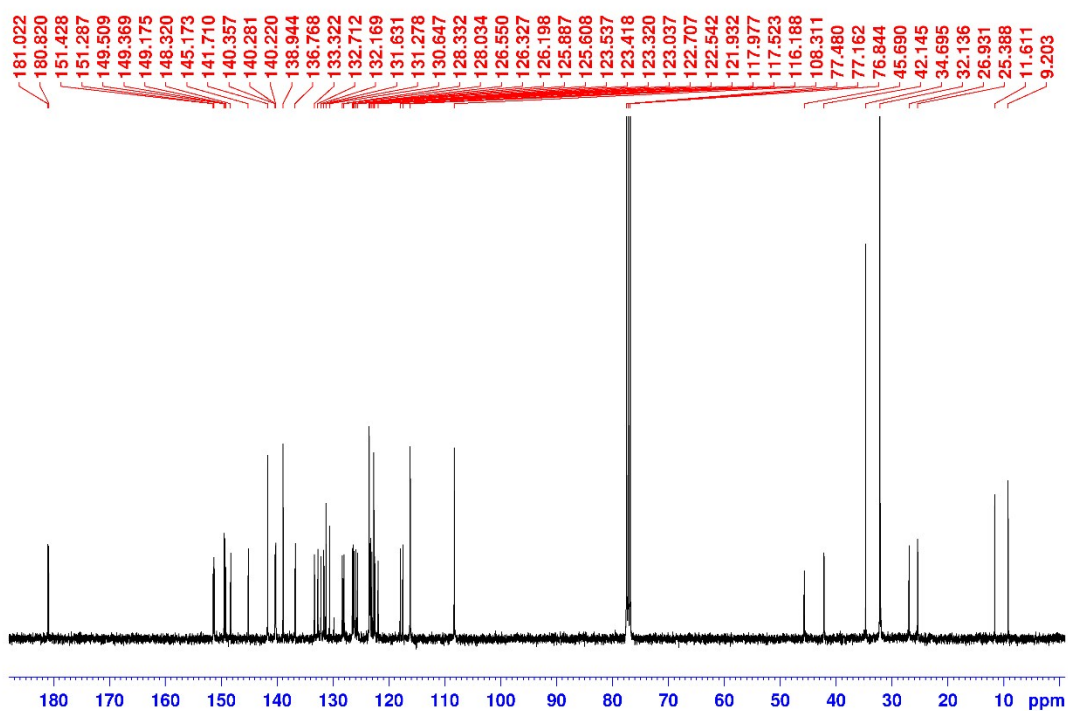


Fig. S8 ^{13}C NMR spectrum of **3** in CDCl_3 .

207 #13 RT: 0.17 AV: 1 NL: 3.56E8
T: FTMS + p ESI Full ms [150.00-2000.00]

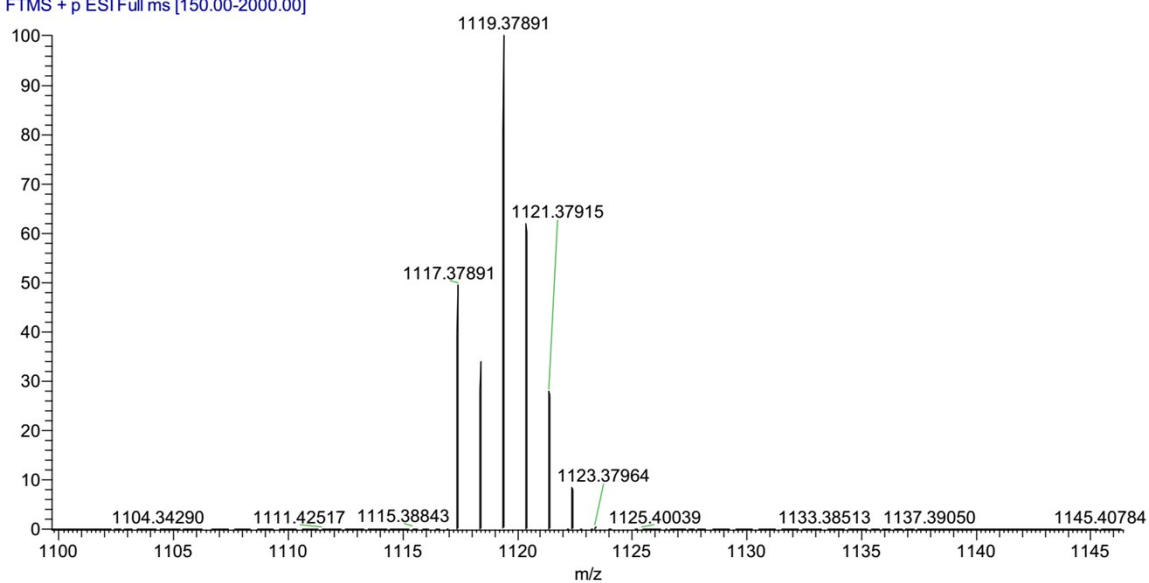


Fig. S9 HRMS (ESI-TOF) spectrum of **3**.

Table S1. The quantum yield in aggregation and solid state for complexes 1-3^a

Complex	Φ_{EtOH}	$\Phi_{(\text{EtOH}/\text{water}=8/2)}$	Φ_{solid}
1	0.013	0.036	0.106
2	0.007	0.043	0.109
3	0.039	0.067	0.132

^a Absolute phosphorescence quantum yield determined by calibrated integrating sphere system at 298 K under air.

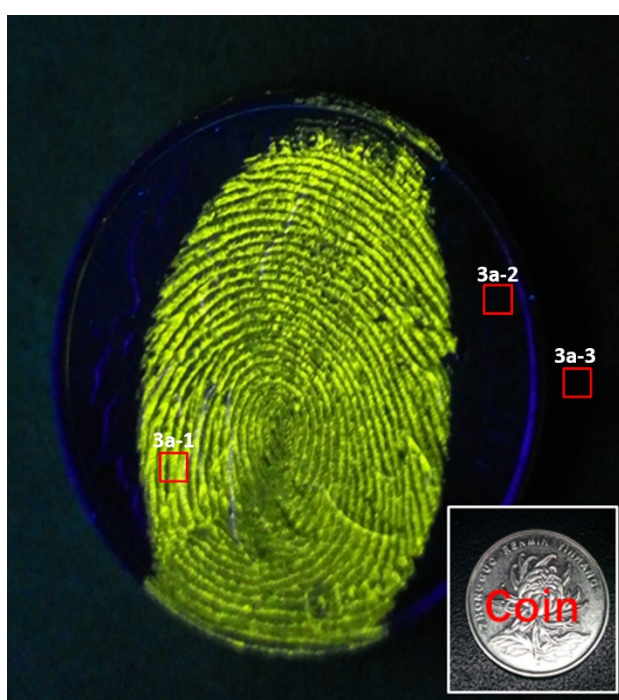


Fig. S10 The mean intensity of red areas 3a-1 (specific uptake), 3a-2 (nonspecific uptake) and 3a-3(background) were remarked for the fingerprints (Fig. 3a) signal to noise ratio (S/N) calculation.

Table S2. The fingerprints (Fig. 3a) signal to noise ratio (S/N) calculation.

Area Name	Mean Intensity
3a-1	126.550
3a-2	7.971
3a-3	6.196

Formulation S1:

$$S/N_{3a}=(126.550-6.196)/(7.971-6.196)=120.354/1.775=67.805$$

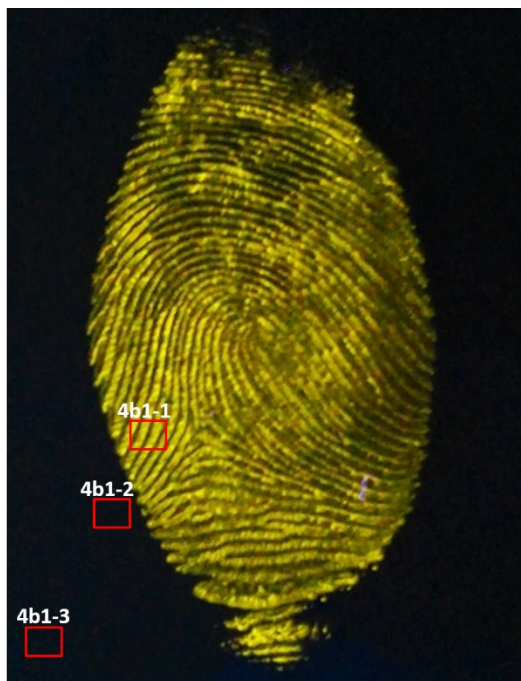


Fig. S11 The mean intensity of red areas 4b1-1(specific uptake), 4b1-2(nonspecific uptake) and 4b1-3(background) were remarked for the fingermarks (Fig. 4b1) signal to noise ratio (S/N) calculation.

Table S3. The fingermarks (Fig.4b1) signal to noise ratio (S/N) calculation.

Area Name	Mean Intensity
4b1-1	114.520
4b1-2	18.640
4b1-3	18.243

Formulation S2:

$$S/N_{4a1}=(114.520-18.243)/(18.640-18.243)=96.277/0.397=242.511$$

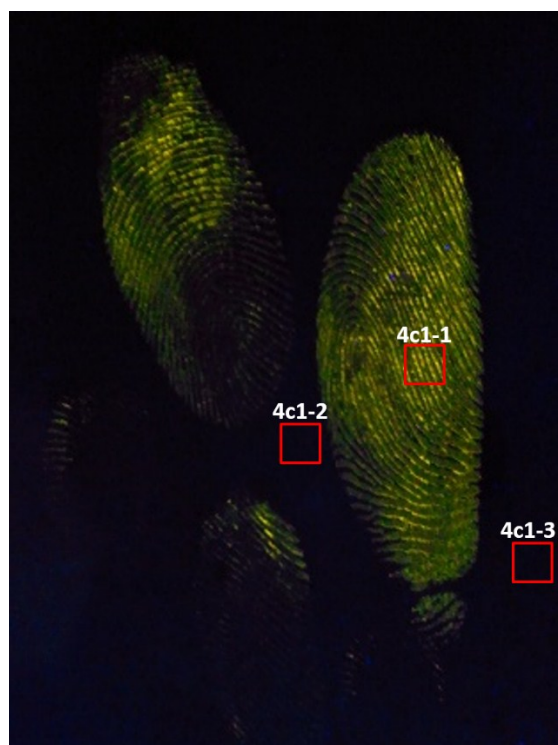


Fig. S12 The mean intensity of red areas 4c1-1(specific uptake), 4c1-2(nonspecific uptake) and 4c1-3(background) were remarked for the fingerprints (Fig. 4c1) signal to noise ratio (S/N) calculation.

Table S4. The fingerprints (Fig. 4c1) signal to noise ratio (S/N) calculation.

Area Name	Mean Intensity
4c1-1	73.676
4c1-2	13.365
4c1-3	12.265

Formulation S3:

$$S/N_{4c1} = (73.676 - 12.265) / (13.365 - 12.265) = 61.411 / 1.100 = 55.828$$