Supporting Information

for

An aggregation-induced emission luminogen combined with a cyanoacrylate fuming method for latent fingerprint analysis

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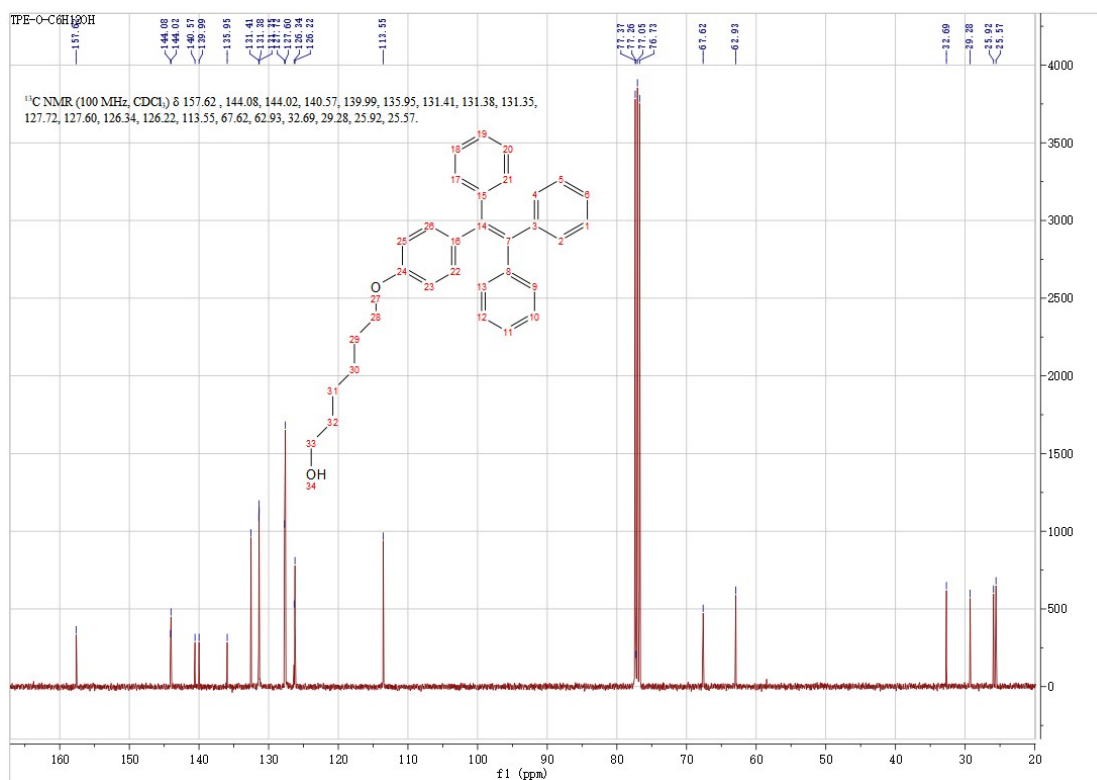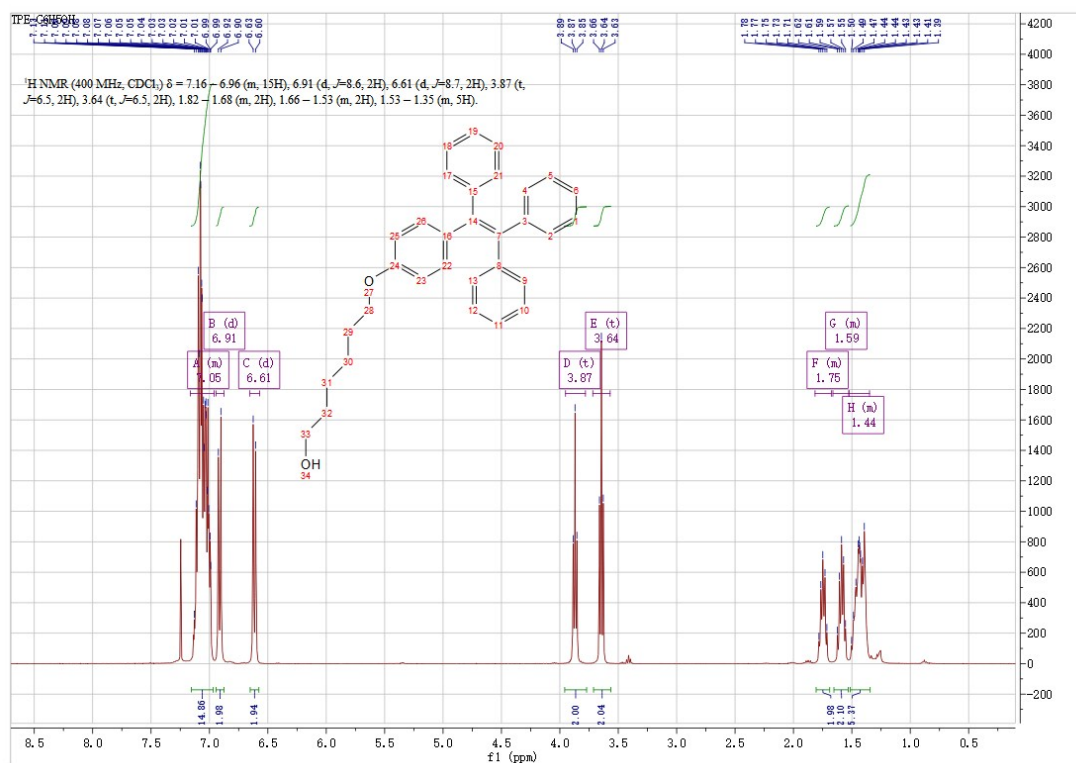
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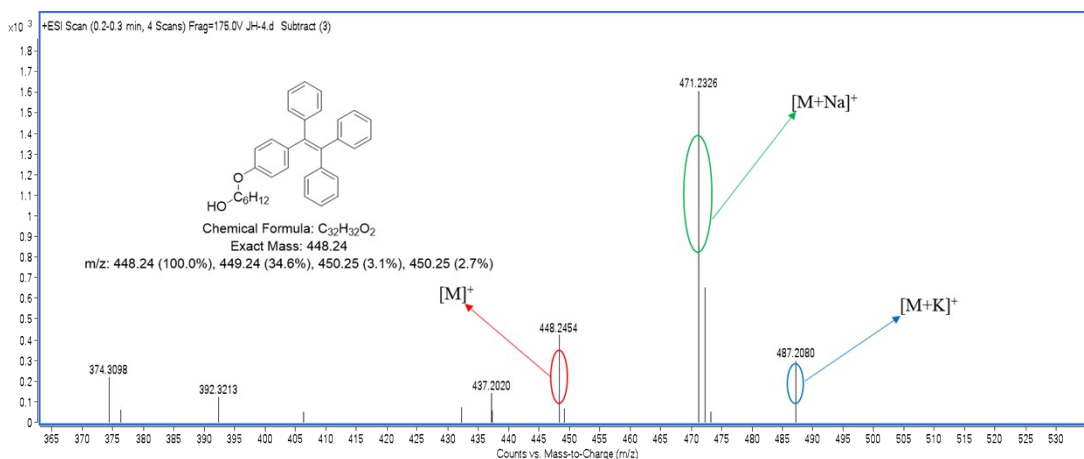
Fig. S1 ^{1}H NMR spectrum of **FLA-2**.

^{1}H NMR (400 MHz, CDCl$_3$) δ = 7.16 – 6.96 (m, 15H), 6.91 (d, J=8.6, 2H), 6.61 (d, J=8.7, 2H), 3.87 (t, J=6.5, 2H), 3.64 (t, J=6.5, 2H), 1.82 – 1.68 (m, 2H), 1.66 – 1.53 (m, 2H), 1.53 – 1.35 (m, 5H).

Fig. S2 ^{13}C NMR spectrum of **FLA-2**.

^{13}C NMR (100 MHz, CDCl$_3$) δ 157.62 , 144.08, 144.02, 140.57, 139.99, 135.95, 131.41, 131.38, 131.35, 127.72, 127.60, 126.34, 126.22, 113.55, 67.62, 62.93, 32.69, 29.28, 25.92, 25.57.
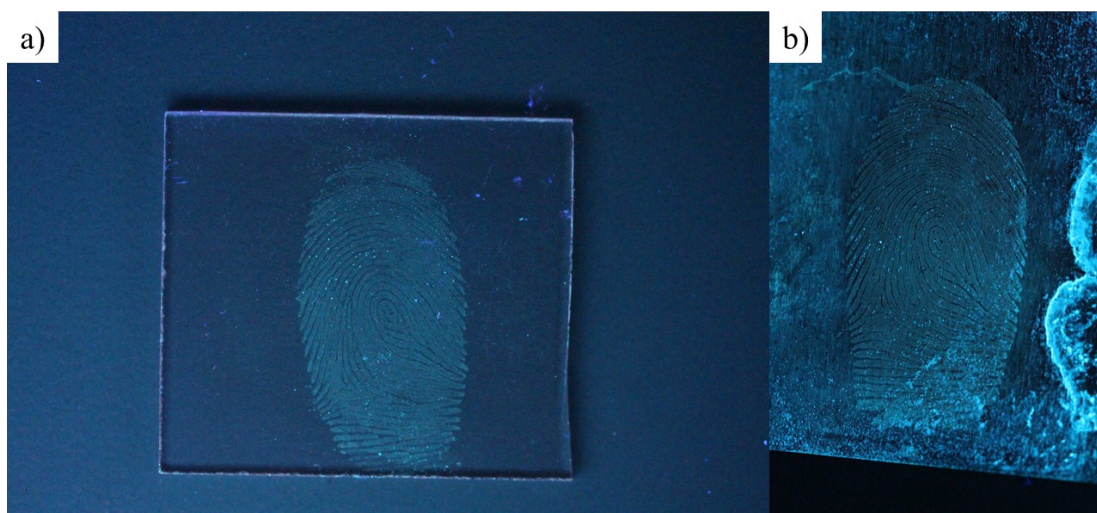
Fig. S3 Mass spectrum of **FLA-2**.

Fig. S4 Original fluorescence images of sebaceous fingerprints on a a) glass slide, and b) aluminum foil developed by AIE of **FLA-2** aggregates.
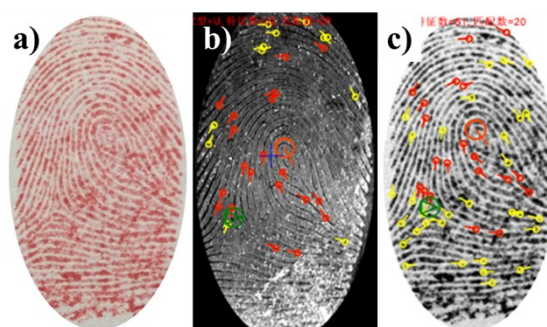

Fig. S5 a) Standard ink fingerprint taken as reference; Automated Fingerprint Identification System (AFIS) analysis for fingerprint images developed by using the dye **FLA-2** on an aluminum foil substrates b) and validated by the corresponding matches obtained from a database of the ink fingerprint c). Note: the yellow ○ and red ○ represent the minutia points of the fingerprint; the red ○ also represents the corresponding points observed in both the standard ink fingerprint and the fingerprint developed using the dye **FLA-2**.
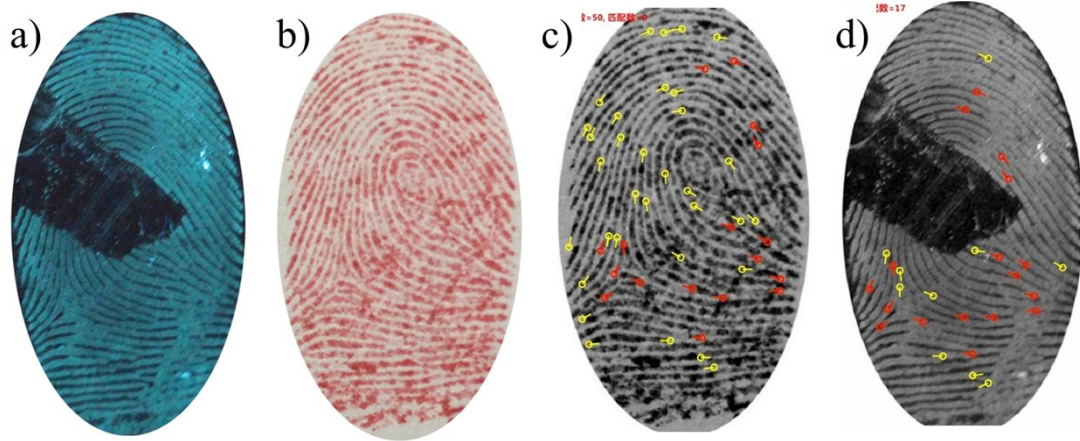
Fig. S6 a) The LFPs visualized by the dye **FLA-2**, irradiated by a hand-held UV lamp onto the surface of glass slide; b) standard ink fingerprint taken as a reference; c) ink fingerprint for analysis of correspondences; d) AFIS analysis for fingerprints images developed by using dye **FLA-2** on a glass slide surface with the ink fingerprint. Note: the yellow ○ and red ○ represent the minutia points of the fingerprint; the red ○ also represents the corresponding points observed in both the standard ink fingerprint and the fingerprint developed using the dye **FLA-2**.
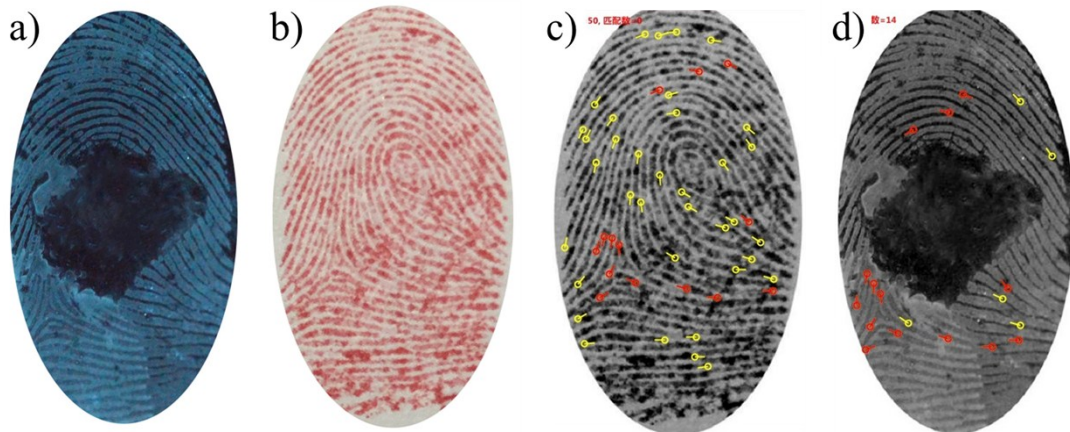

Fig. S7 a) The LFPs visualized by the dye **FLA-2**, irradiated by a hand-held UV lamp onto the surface of glass slide; b) standard ink fingerprint taken as a reference; c) ink fingerprint for analysis of correspondences; d) AFIS analysis for fingerprints images developed by using dye **FLA-2** on a glass slide surface with the ink fingerprint. Note: the yellow ○ and red ○ represent the minutia points of the fingerprint; the red ○ also represents the corresponding points observed in both the standard ink fingerprint and the fingerprint developed using the dye **FLA-2**.
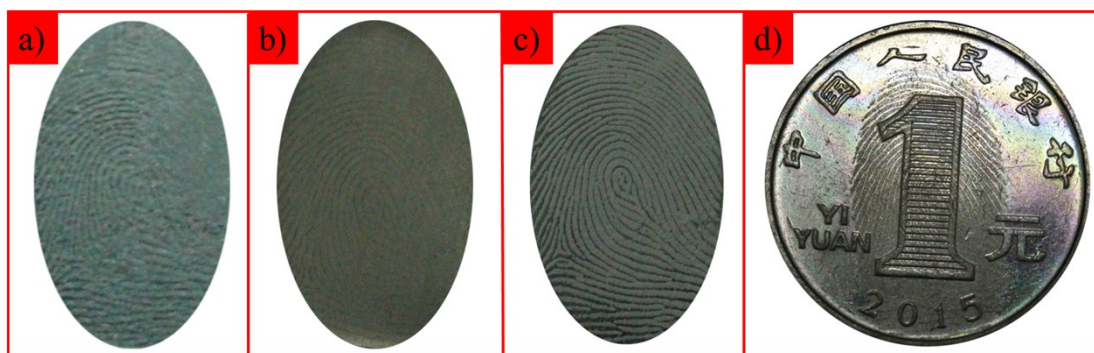
Fig. S8 The images (a-d) of fingerprints pretreated with the cyanoacrylate fuming method on the a) glass slide, b) stainless steel sheet, c) aluminum foil, d) coin substrates under daylight.
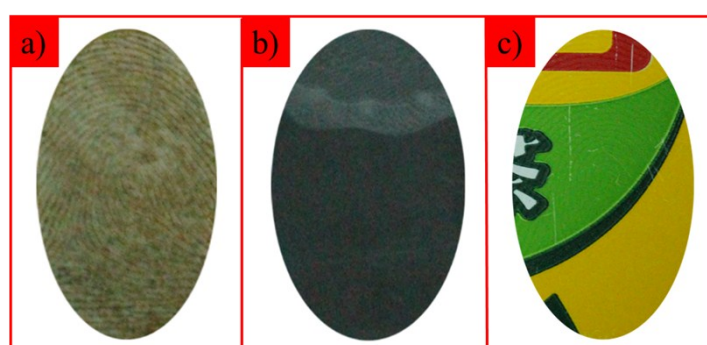

Fig. S9 The images (a-c) of fingerprints pretreated with the cyanoacrylate fuming method on the a) marble, b) soft drink label, and c) pop-top can substrates under daylight.
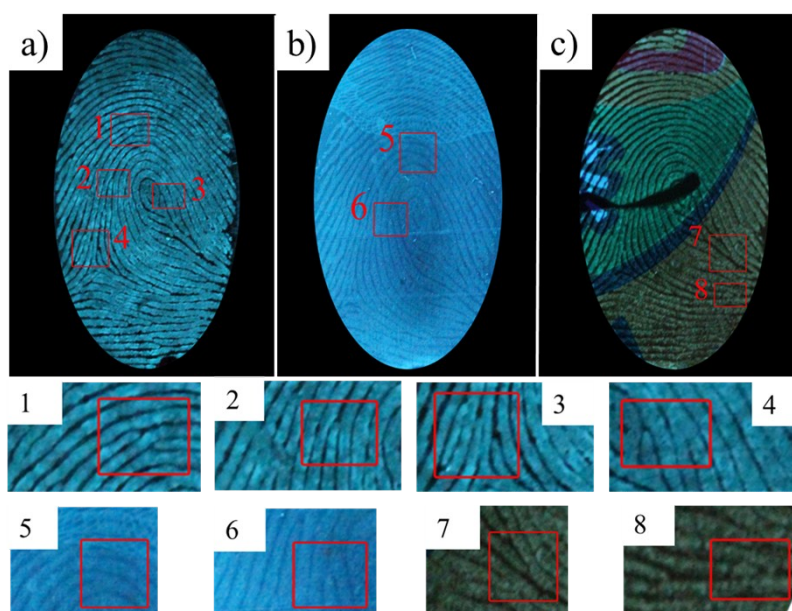

Fig. S10 The fluorescent images (a–c) of fingerprints pretreated with the cyanoacrylate fuming method and incubating with the dye **FLA-2** solution on: a) marble, b) soft drink label, and c) pop-top can, and the corresponding fluorescent images of the enlarged level-2 fingerprint details (1–8).
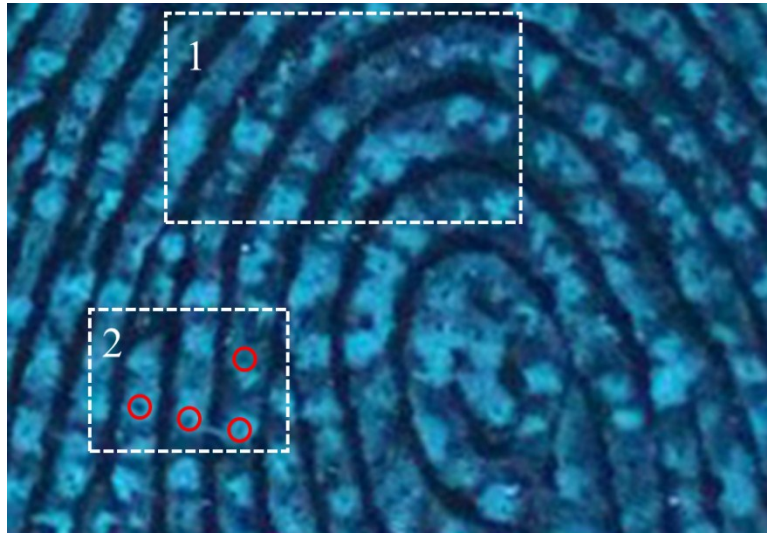
Fig. S11 The level-3 fingerprint fluorescent image and the enlarged fine structure of ridges in (1) and sweat pores in (2). (the red ○)
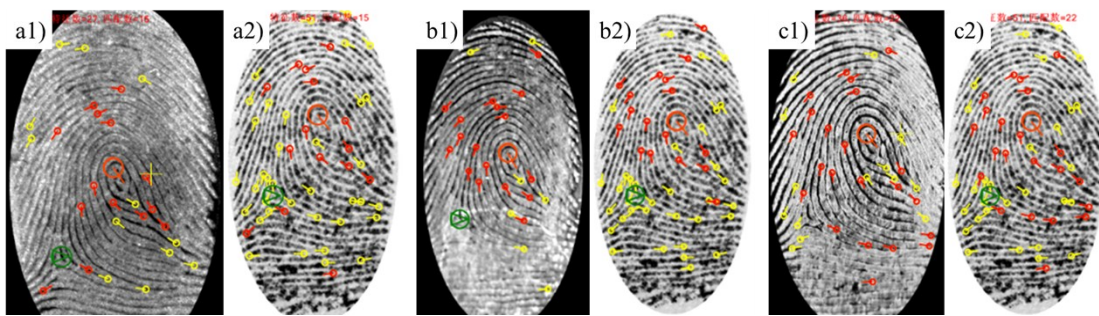

Fig. S12 AFIS analysis of old fingerprint images: a1) 7d, b1) 16 d, c1) 30 d developed by using the dye **FLA-2** on an aluminum foil substrate and validated by the corresponding matches obtained from a database of the ink fingerprint a2－c2). Note: the yellow ○ and red ○ represent the minutia points of the fingerprint; the red ○ also represents the corresponding points observed in both the standard ink fingerprint and the fingerprints developed using the dye **FLA-2**.
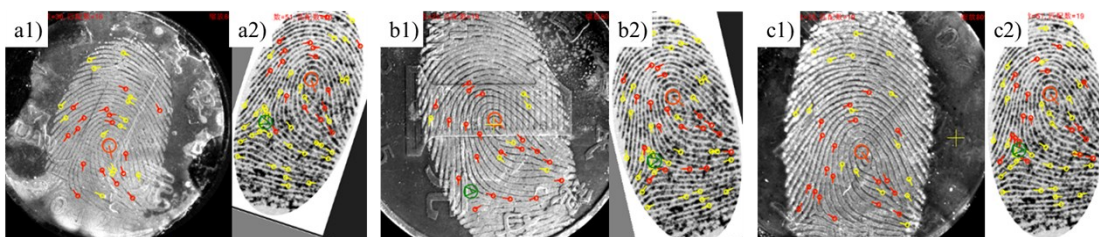

Fig. S13 AFIS analysis of old fingerprint images: a1) 7d, b1) 16 d, c1) 30 d developed by using the dye **FLA-2** on a coin surface and validated by the corresponding matches obtained from a database of the ink fingerprint a2－c2). Note: the yellow ○ and red ○ represent the minutia points of the fingerprint; the red ○ also represents the corresponding points observed in both the standard ink fingerprint and the fingerprints developed using the dye **FLA-2**.