Aqueous Nile blue: A simple, versatile and safe reagent for the detection of latent fingermarks

Amanda A. Frick^a, Francesco Busetti^a, Andrew Cross^b and Simon W. Lewis^{*a}

^a Department of Chemistry, Curtin University, GPO Box U1987, Perth, Western Australia 6845, Australia. Fax: +61 8 9266 2300; Tel: +61 8 9266 2484; E-mail: S.Lewis@curtin.edu.au

^bAustralian Federal Police Forensics, GPO Box 401, Canberra ACT 2601

Electronic Supporting information

Figure S1: Comparison with Fingermarks developed with Aqueous Nile Blue with Nile Red

Latent fingermarks on white copy paper treated with Nile blue and Nile red (as per K. Braasch, M. de la Hunty, J. Deppe, X. Spindler, A. A. Cantu, P. Maynard, C. Lennard and C. Roux, *Forensic Science International*, 2013, **230**, 74-80.), photographed using a Nikon D300 camera (excitation with a Polilight PL 500 at 505 nm excitation and viewed through a 550 nm barrier filter, aperture f/11, shutter speed 1.0 s).

Figure S1 A: Depletion series (repeat impressions with same fingers without recharging of material)



Figure S1 B: Impressions deposited by two different donors developed 24 hrs after deposition



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Fluorescence spectra of fingermarks treated with aqueous Nile blue (blue line) and an organic extract (petroleum spirits 60-80 °C) of aqueous Nile blue (red line). Spectra collected with a Cary fluorescence spectrophotometer with a fibre optic probe attachment (Varian, Mulgrave, Australia), excitation at 490 nm, excitation and emission slit widths of 5 nm.

Figure S2: High Resolution Mass Spectrometry

High resolution mass spectra (HRMS) were obtained with a LTQ Orbitrap (Thermo Fisher Scientific, USA) and an electrospray ion source operated in eV+ mode. For confirmation purposes, a standard solution of Nile red and a sample extract were analysed in full MS² mode. The HRMS analysis showed the presence of Nile red in the sample extract with a measured accurate mass of 319.1441 (mass error < -0.049 ppm). Figure S2, shows the accurate MS² spectra of Nile red in a standard solution (a) and in a sample extract (b). Collision induced dissociation experiments, further confirmed the identity of Nile red in the sample extract by returning four characteristic fragments with the same accurate mass and similar relative abundance respect to those obtained from a standard solution. Table S1, reports elemental formula, experimental and theoretical m/z values, as well as relative error (ppm) for parent ion and main fragments observed in the sample extract.



High resolution MS^2 spectra of Nile red ([M+H]⁺ theoretical monoisotopic m/z= 319.1441) in a standard solution (a) and a sample extract (b).

Table S1

Mass to charge ratios (m/z) observed from analysis of a sample extract of Nile red. Elemental formula, i.d. of fragments, experimental and theoretical m/z values as well as relative error (part per million, ppm) are also reported. Data was processed using the Xcalibur QualBrowser 2.0.7 SP1 software.

Elemental formula	Loss of	Experimental value (m/z)	Theoretical value (m/z)	Relative error (ppm)
$C_{20}H_{19}O_2N_2$		319.1441	319.1441	-0.049
$C_{19}H_{16}O_2N_2$	CH ₃	304.1202	304.1206	-1.313
$C_{18}H_{13}O_2N_2$	C_2H_6	289.0969	289.0972	-1.593
$C_{17}H_{11}O_2N_2$	C_3H_8	275.0813	275.0815	-0.813
$C_{16}H_{10}O_2N$	C_4H_9N	248.0702	248.0706	-1.593