Electronic Supplementary Information

High-performance liquid chromatographic analysis of as-synthesised *N,N'*-dimethylformamide-stabilised gold nanoclusters product

Shunping Xie,[a] Man Chin Paau,[a] Yan Zhang,[b] Shaomin Shuang,*[b] Wan Chan[c] and Martin M. F. Choi*[a]

[a] *Department of Chemistry, Hong Kong Baptist University, 224 Waterloo Road, Kowloon Tong, Hong Kong SAR, People's Republic of China.*
E-mail: mfchoi@hkbu.edu.hk
[b] *School of Chemistry and Chemical Engineering, Shanxi University, Taiyuan 030006, People's Republic of China*
E-mail: smshuang@sxu.edu.hk
[c] *Department of Chemistry, Division of Environment, The Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong SAR, People's Republic of China*

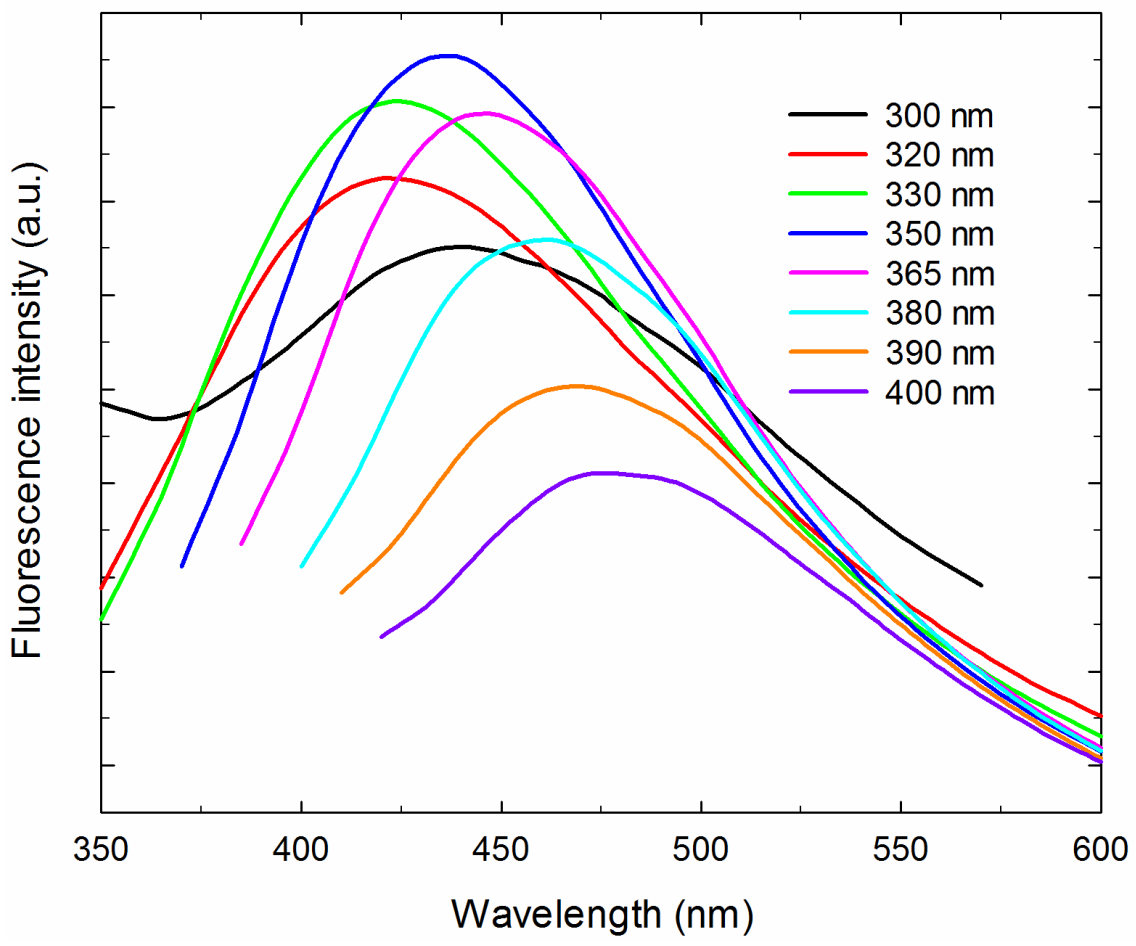


Fig. S1 Photoluminescence spectra of DMF-AuNCs in aqueous solution at different excitation wavelengths. The blue line displays the strongest fluorescence emission when excited at 350 nm.

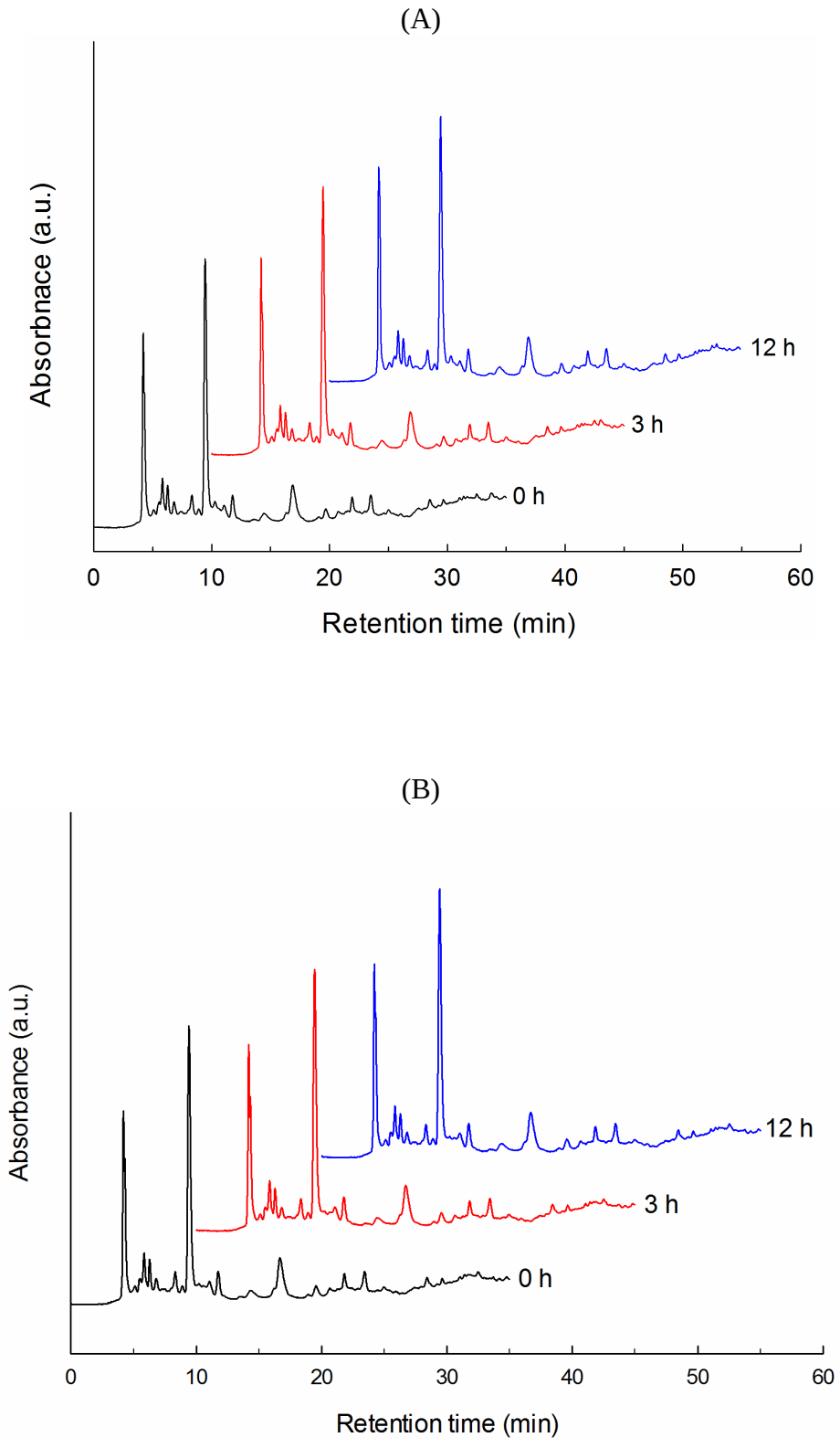


Fig. S2 HPLC chromatograms of the as-prepared DMF-AuNCs product dissolved in (A) MeOH/H_2O (3:97 v/v) and (B) MeOH/H_2O (1:4 v/v) which was left to stand for 0, 3, and 12 h respectively. The detection wavelength is 250 nm.

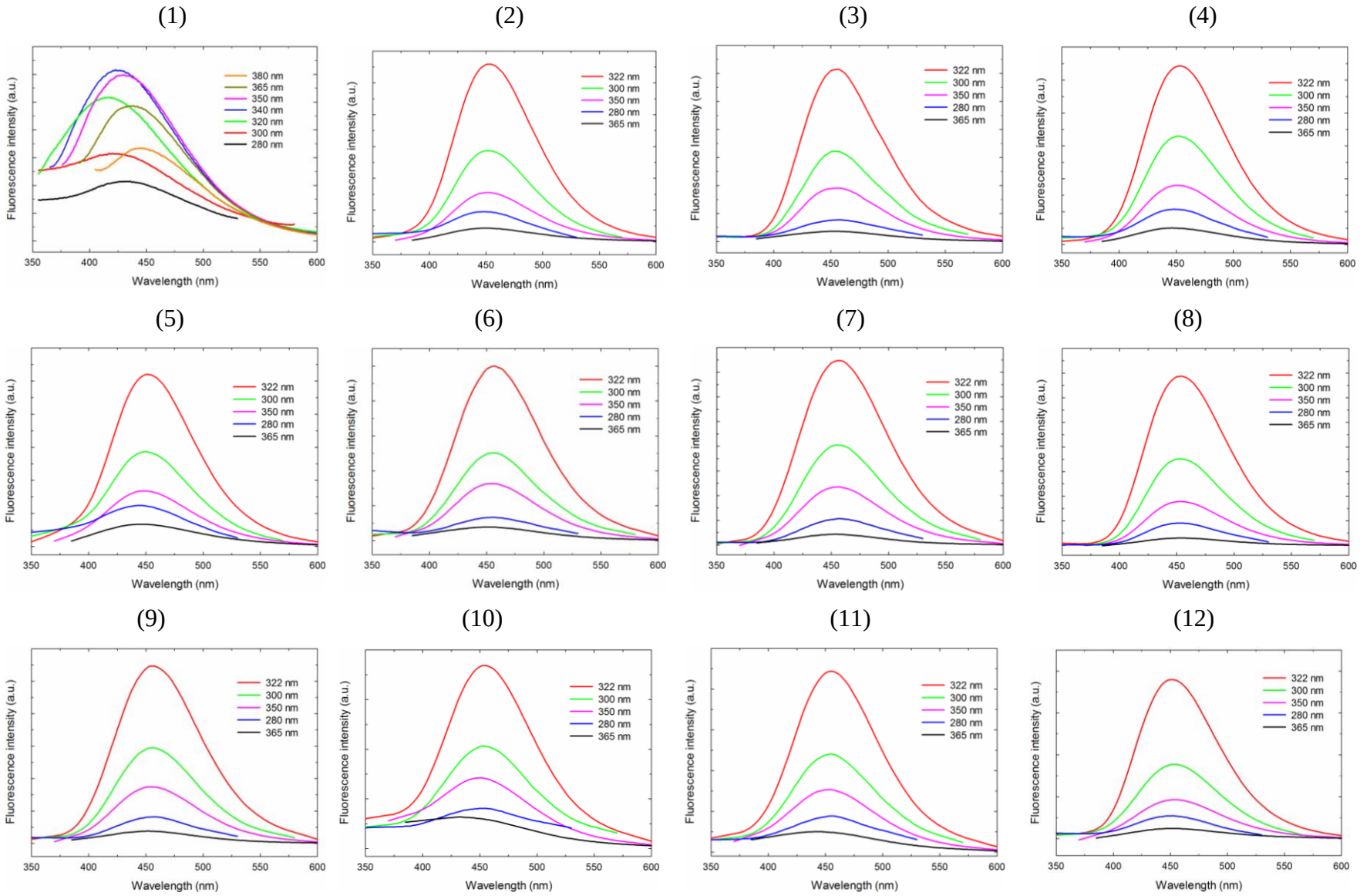


Fig. S3 Photoluminescence spectra of HPLC Fraction 1–12 at different excitation wavelengths.

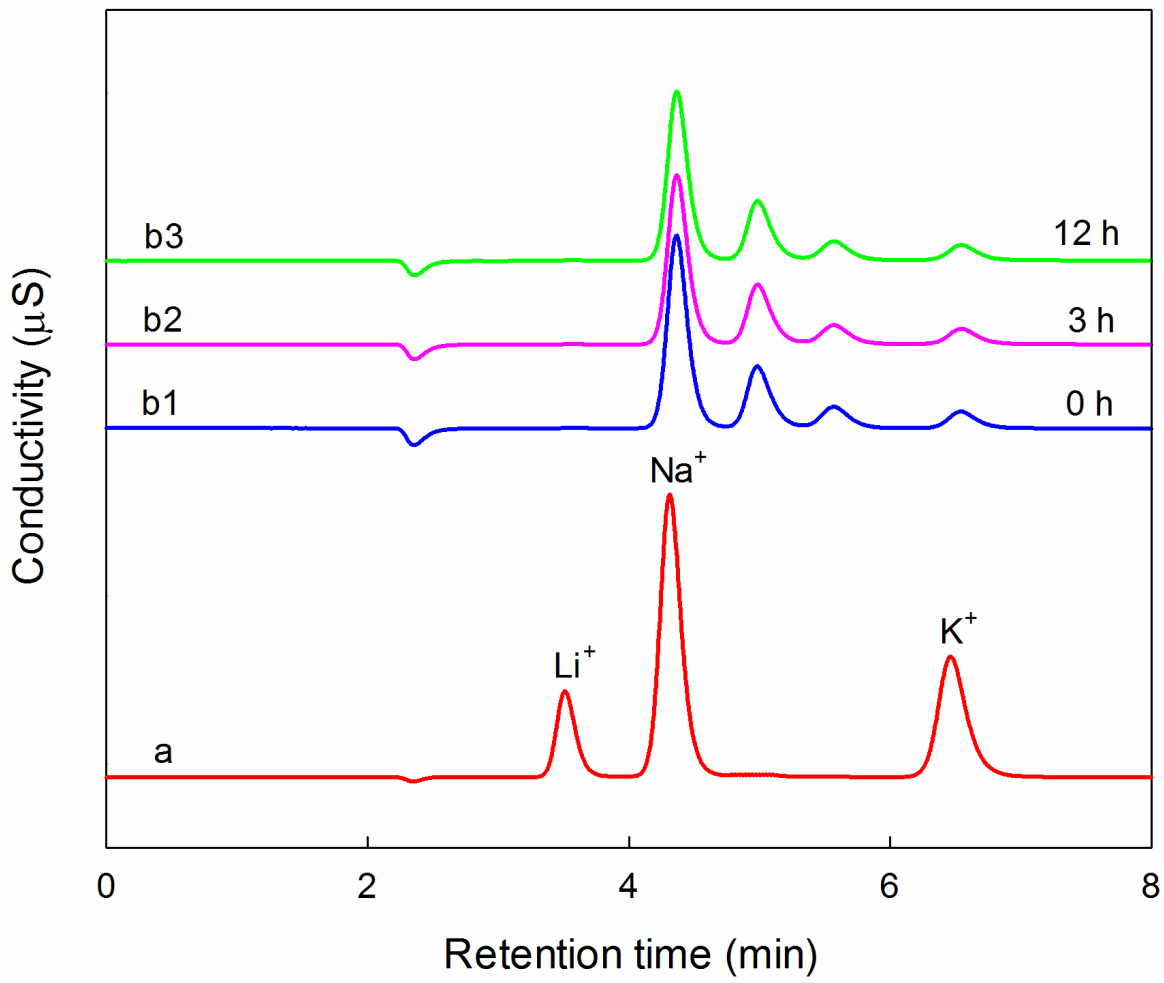


Fig. S4 Ion chromatographic separation of (a) a standard mixture of Li^+ (0.50 ppm), Na^+ (5.0 ppm) and K^+ (5.0 ppm) and (b1–b3) HPLC Fraction 1 dissolved in 20.0 mM CH_3SO_3H which was left to stand for 0, 3 and 12 h respectively.

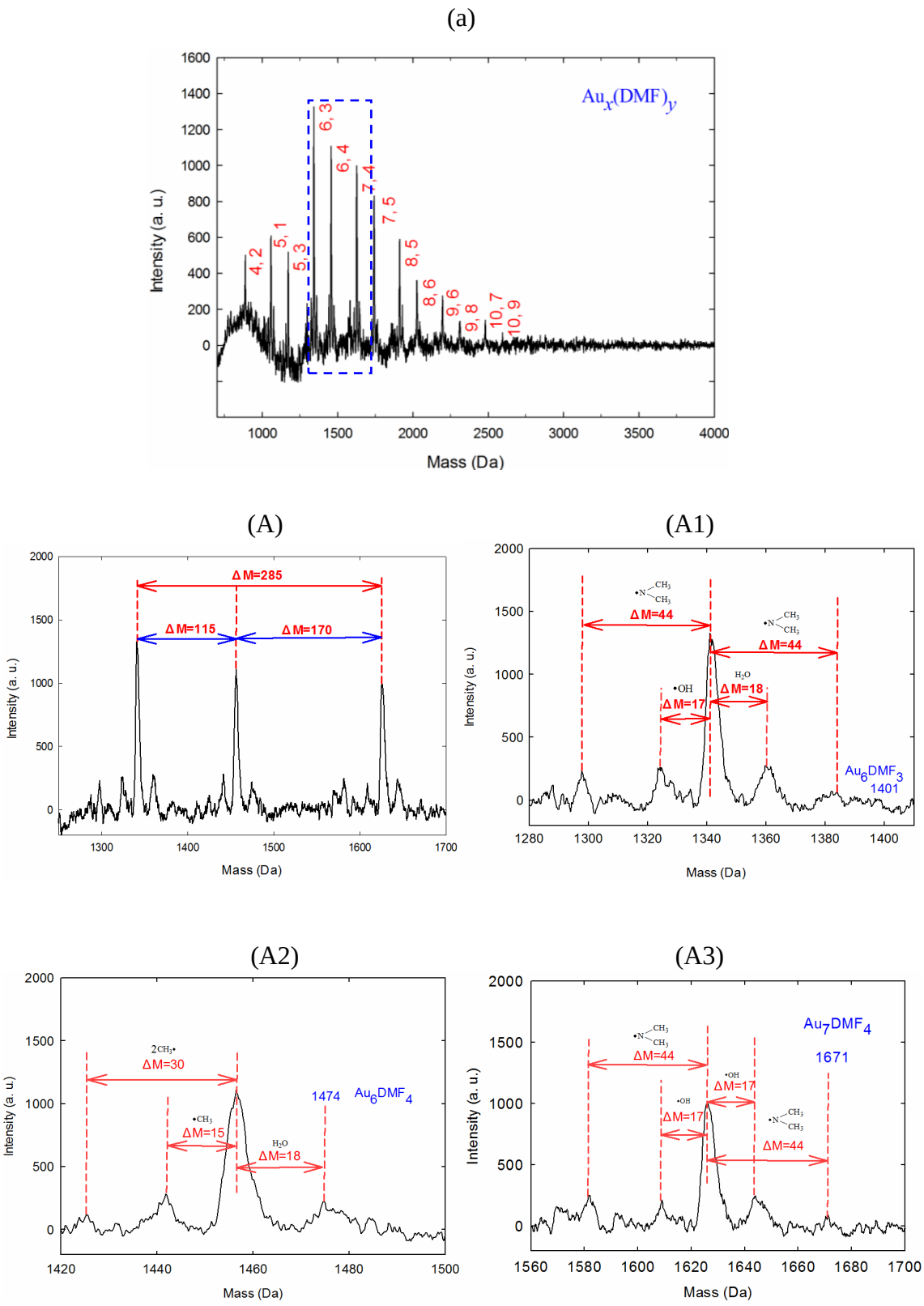
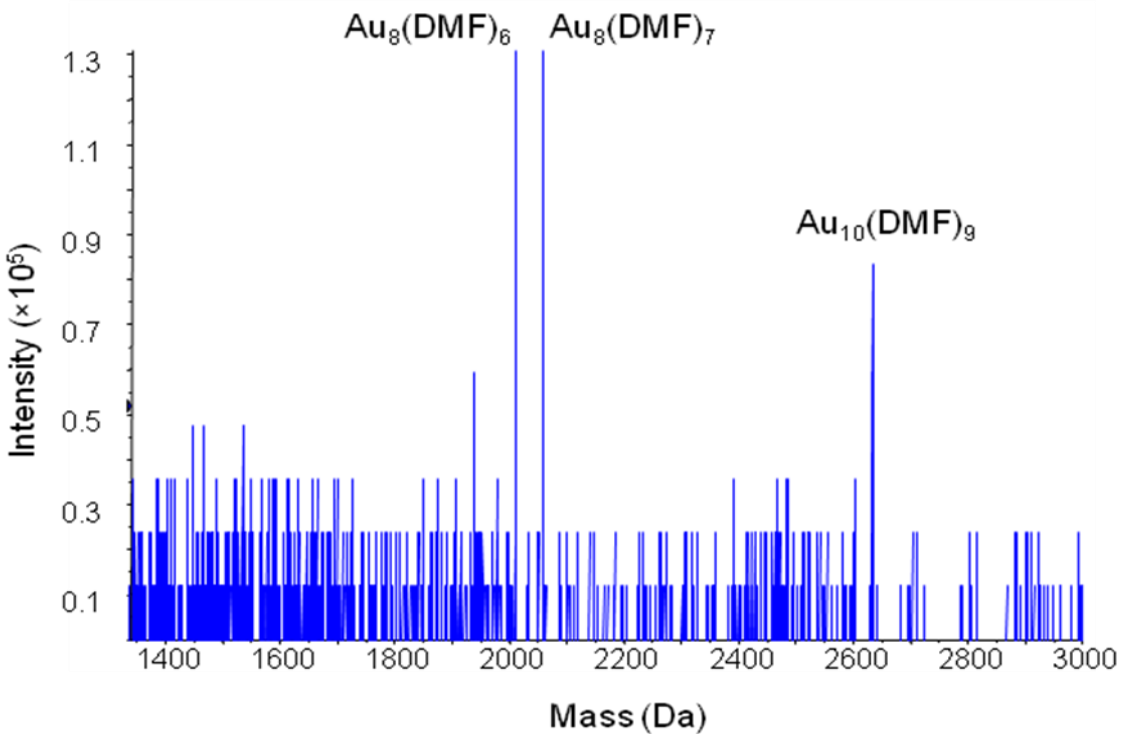


Fig. S5 (a) MALDI-TOF mass spectra of HPLC Fraction 1. (A) is the expanded mass spectrum of the blue dash rectangle in (a). (A1)–(A3) are the expanded mass spectra of (A).

Fraction 1



Fraction 6

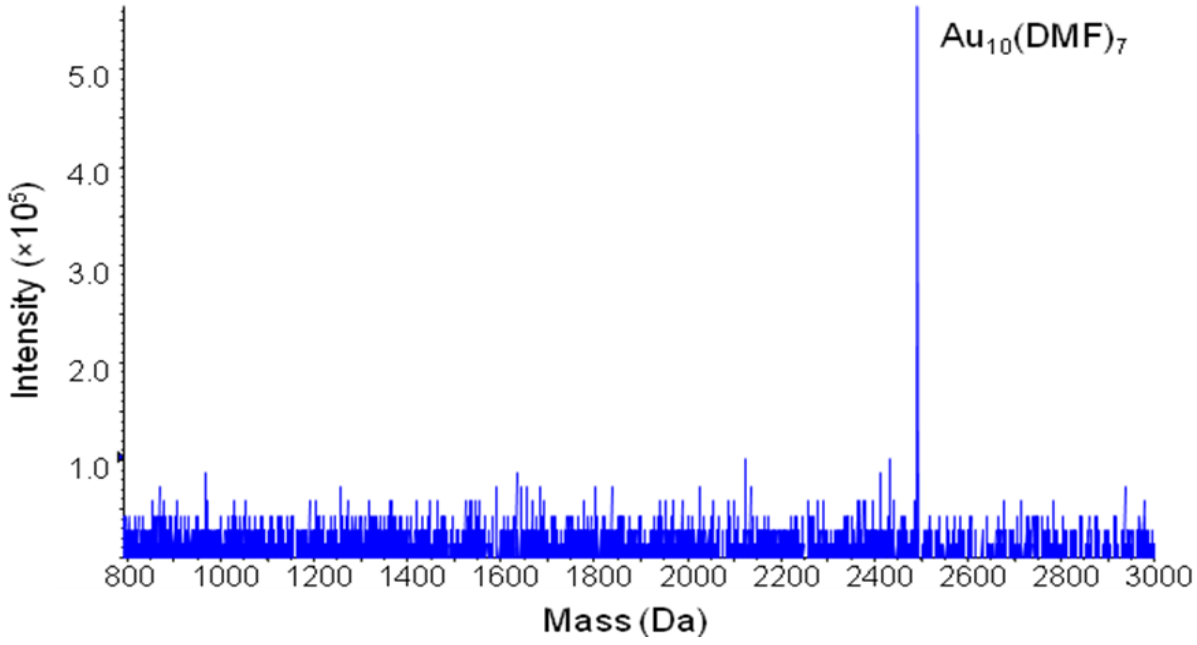


Fig. S6 ESI-MS of HPLC Fraction 1 and 6.

Table S1 Quantum yields of Fraction 1–12

HPLC fraction	Gold nanocluster species[a]	Quantum yield (%)
As-synthesised product	$Au_x(DMF)_y$ (where x = 10–14 and y = 6–12)	0.73
1	$[Au_{10}(DMF)_9]^+$	0.31
2	$Au_{10}(DMF)_9$	0.82
3	$Au_{11}(DMF)_{10}$	0.31
4	$Au_{13}(DMF)_{10}$	4.1
5	$Au_{13}(DMF)_{12}$	2.1
6	$Au_{10}(DMF)_7$	0.23
7	$Au_{12}(DMF)_9$	1.7
8	$Au_{14}(DMF)_{10}$	1.4
9	$Au_{10}(DMF)_6$	1.8
10	$Au_{11}(DMF)_6$	0.44
11	$Au_{12}(DMF)_7$	0.50
12	$Au_{11}(DMF)_9$	0.54

[a] Determined by MALDI-TOF MS.