Dendron-stabilised gold nanoparticles: generation dependence of core size and thermal stability

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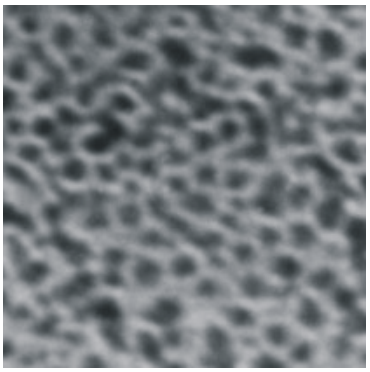
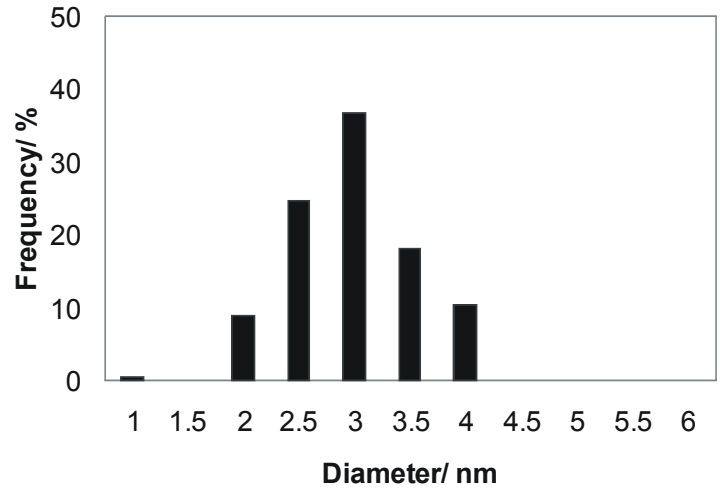
Supplementary Information

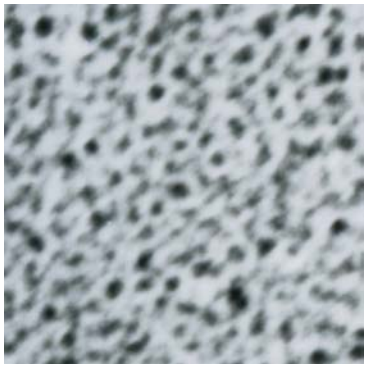
TEM images of dendron-stabilised Au nanoparticles

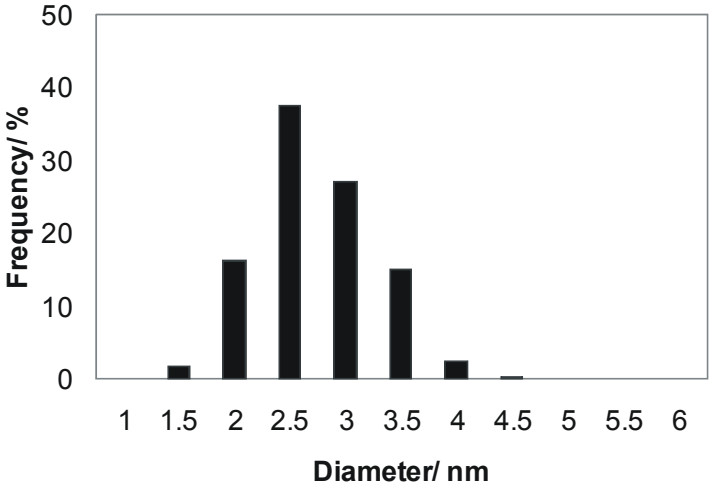
G1-Au



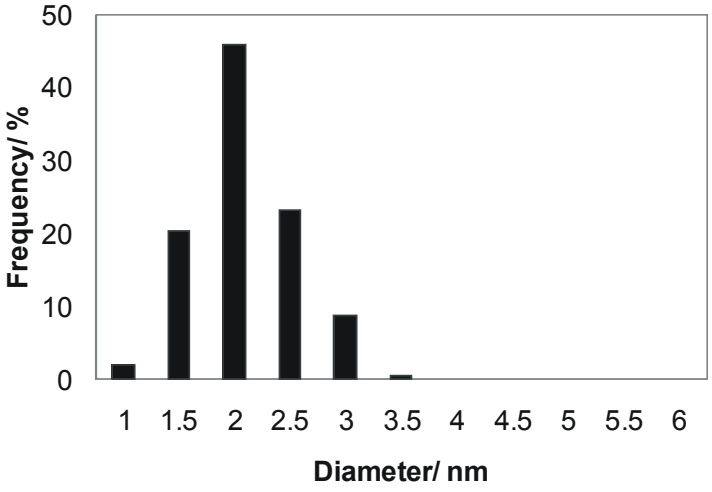


G2-Au





G3-Au



Characterisation data for dendrimers G1SSG1 and G2SSG2.

G1SSG1. Pale yellow solid (83 %). R_f 0.54 (CH_2Cl_2:MeOH 90:10), Melting point: 88-90 °C, α_D^{293} +18.9 (c = 1.0, $CHCl_3$), +19.23 (c = 1.0, MeOH), m/z (ES+) $C_{36}H_{68}N_6O_{10}S_2$ $[M]^+$ requires 808.3; found 831.3 (100%, $[M+Na]^+$)., HR FAB-MS calculated for $C_{36}H_{68}N_6O_{10}Na_1S_2$ 831.4336; found 831.4338, δ_H (270 MHz, CD_3OCD_3) 7.70 (2H, t, J 7.5, CON*H*), 6.15 (2H, t, J 8.0, CON*H*), 5.98 (2H, t, J 7.5, CON*H*), 4.10-4.08 (2H, m, COC*H*), 3.54-3.51 (4H, m, SCH_2CH_2NH), 3.06 (4H, q, J 6.5, CH_2CH_2NH), 2.86 (4H, t, J 6.5, SCH_2CH_2NH), 1.9-1.37 (48H, m, CH_2, CH_3), δ_C (67.9 MHz, D_2O) 173.4 (NH*C*OCH x 2), 156.6 (NH*C*OO x 2), 156.3 (NH*C*OO x 2), 79.1 (O*C*$(CH_3)_3$ x 2), 78.2 (O*C*$(CH_3)_3$ x 2), 55.3 (NHCO*C*H x 2), 40.6 (SCH_2CH_2NH x 2), 38.9 (CH_2CH_2NH x 2), 38.3 (SCH_2CH_2NH x 2), 33.0 (CH_2 x 4), 28.5 (CCH_3 x 6), 28.4 (CCH_3 x 6), 23.5 (CH_2 x 2) ν_{max} (KBr disc) 3346m (CONH), 2978m, 2935m, 2863w (CH_2, CH_3), 1687s (CONH), 1656s (CONH), 1524s (CONH), 1366m ($C(CH_3)$).

G2SSG2. White solid (60 %). R_f 0.30 (CH_2Cl_2:MeOH 90:10), Melting point: 119-121 °C, α_D^{293} –14.4 (c = 1.0, MeOH), m/z (ES+) $C_{168}H_{308}N_{30}O_{46}S_2$ [M]+ requires 3548.4; found 1797.1 (100%, $[M+2Na]^{2+}$), 1205.4 (55 %, $[M+3Na]^{3+}$) , δ_H (270 MHz, CD_3OD) 4.29 (6H, m, COC*H*(R)NH), 4.00 (8H, m, COC*H*(R)NH), 3.49 (4H, m, SCH_2CH_2NH), 3.18 (12H, m, CH_2CH_2NH), 3.03 (16H, m, CH_2CH_2NH), 2.84 (4H, m, SCH_2CH_2NH), 1.80-1.30 (228H, m, CH_2, CH_3), δ_C (67.9 MHz, CD_3OD) 175.2, 175.0, 172.2, 174.0 (*C*ONH x 14), 158.5 (NH*C*OOC$(Me)_3$ x 12), 157.8 (NH*C*OOC$(Me)_3$ x 4), 80.6 (O*C*$(Me)_3$ x 4), 80.5 (O*C*$(Me)_3$ x 4), 79.8 (O*C*$(Me)_3$ x 8), 56.3, 56.2, 54.8, 54.7, 54.6 (All CO*C*H(R)NH x 14), 41.0 (CH_2CH_2NH x 8 and SCH_2CH_2NH x 2), 40.1 (CH_2NH x 6 and SCH_2CH_2NH x 2), 33.3, 32.9, 32.8, 32.6, 30.6, 30.0 (All CH_2),

28.9 (*C*H_3 x 48), 24.2 (*C*H_2), $_{max}$ (KBr disc) 3310m (CONH), 2977m, 2935m (CH_2, CH_3), 2866w (CH), 1691s (CONH), 1655s (CONH), 1523 s (CONH), 1458w (CH_2, CH_3), 1366m ($C(Me)_3$), 1250m (COO), 1172m (COO).

Characterisation data for nanoparticles G1-Au and G2-Au.

G1-Au. δ_H (270 MHz, $CDCl_3$) 4.40-4.00 (COC*H*), 3.15-3.00 (C*H*$_2$NH), 1.80-1.10 (C*H*$_2$, C*H*$_3$), ν_{max} ($CHCl_3$ solution) 3310m (CONH), 2979m, 2928m, 2862w (CH_2, CH_3), 1695s (CONH), 1510s (CONH), 1172s (COO).

G2-Au. δ_H (270 MHz, $CDCl_3$) 4.30-4.00 (COC*H*), 3.20-2.90 (C*H*$_2$NH), 1.90-1.10 (C*H*$_2$, C*H*$_3$) ν_{max} ($CHCl_3$ solution) 3307m (CONH), 2979m, 2934m, 2864w (CH_2, CH_3), 1695s (CONH), 1516s (CONH).