Synthesis, $H_2PO_4^-$ and Pd^{2+} ions sensing and Gold nanoparticles encapsulation of ferrocenyldendrimers by Green chemistry approach.

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Supporting Information

S1: General Experimental procedure

General Information

Analytical TLC was performed on commercial Merk plates coated with Silica Gel GF254. Analytical samples were obtained from flash silica gel chromatography, using silica gel of 100-200 mesh and elution with solvent system as mentioned order each experiment. ^{1}H and ^{13}C NMR spectra were recorded on a 300 MHz BRUKER AVANCE (75 MHz for ^{13}C NMR) spectrometer. All chemical shifts values are reported in ä ppm relative to internal standard tetramethylsilane (TMS, ä 0.00). ^{13}C chemical shifts are reported relative to $CDCl_3$ (center of triplet, δ 77.23) or relative to DMSO-d_6 (center of septet, δ 39.51). The spin multiplicities are indicated by the symbols s (singlet), d (doublet), t (triplet), q (quartet), m (multiplet) and br (broad), dd (doublet of doublets). The coupling constants J, are reported in Hertz (Hz). Elemental analysis data was recorded on Vario EL III (CDRI, Lucknow) instrument. Mass spectra (M.S) were recorded obtained using Fast Atom Bombardment and MALDI-TOF. All other chemicals used were of reagent grade (SRL-Mumbai).

General procedure for the synthesis of Cu (I) catalyzed click reaction (Procedure A)

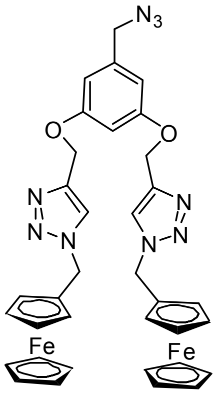
To a mixture of alkyne (1.0 equiv., 1.0 mmol) and *N*-methylmorpholine(1.5 equiv., 1.5 mmol) in water (3 mL) added the azide (2.1 equiv., 2.1 mmol) in the presence of $CuSO_4.5H_2O$ (5 mol %) and NaAsc (10 mol %) and kept under microwave irradiation (80 W) for 1 min. The reaction mixture was kept aside for 5 min and subsequently added NaN_3 (1.5 equiv., 1.5 mmol) in Na_2SO_4 (0.5 g) kept again under microwave irradiation (80 W) for 1 min. water (100 mL) was added to the reaction mixture and stirred for 10 min in order to resume all the Cu (I) trapped in the dendrimer as $Cu(NH_3)_6^+$ and then extracted with $CHCl_3$ (2 X 100 mL). The organic phase was separated and then washed twice with water (2 X 150 mL), dried over Na_2SO_4 and the solvent was removed under vacuum to give the crude triazole, which was purified by column chromatography (SiO_2), using the eluent as mentioned under each compound.

General procedure for solid support click chemistry (Procedure B):

A mixture of azide (1 equiv., 1.0 mmol), alkyne (1 equiv., 1.0 mmol) in Na_2SO_4 (0.5 g) and in the presence of $CuSO_4.5H_2O$ (5 mol %) and NaAsc (10 mol %) was kept under microwave irradiation (80 W) for 1 min. The crude residue was treated with water (150 mL) for 10 min in order to resume all the Cu (I) trapped in the dendrimer as $Cu(NH_3)_6^+$ and then extracted with $CHCl_3$ (2 X 150 mL). The organic layer was separated, washed with brine (1 × 150 mL), dried over Na_2SO_4 and evaporated to give the crude triazole, which was purified by column chromatography (SiO_2), using the eluent as mentioned under each compound.

Ferrocenyl dendritic azide 6:

Following the general procedure A, the dendritic azide **6** was obtained as white solid from 3,5-bis (propargyloxy) benzyl chloride **5** (0.16 g, 0.68 mmol) and azidomethyl ferrocene **4** (0.35 g, 1.4 mmol). R_f = 0.5 ($CHCl_3$:MeOH, 25:1); M.p.: 134-136 °C; ^{1}H NMR: (300 MHz, $CDCl_3$) δ = 4.18 (s, 10H), 4.22 (s, 6H), 4.28 (s, 4H), 5.12 (s, 4H), 5.29 (s, 4H), 6.53 (s, 1H), 6.56 (s, 2H), 7.51 (s, 2H). ^{13}C NMR: (75 MHz, $CDCl_3$) δ = 50.2, 62.2, (68.7, 68.9. 69.1, Cp) 80.6, 101.8, 107.5, 122.2, 137.8, 143.6, 159.7. MS (ESI): *m/z* = 723 [M^+]. Elemental Anal.Calcd for $C_{35}H_{33}Fe_2N_9O_2$: C, 50.11; H, 4.60; N, 17.43 %. Found: C, 58.00; H, 4.47; N, 17.36 %.



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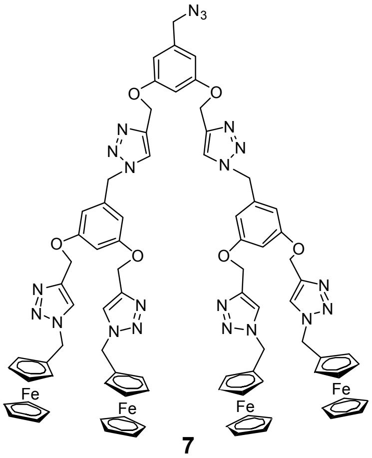
Second generation ferrocenyl dendritic azide 7:

Following the general procedure A, the ferrocenyl dendritic azide **7** was obtained as white solid from 3,5-bis (propargyloxy) benzyl chloride **5** (0.13 g, 0.55 mmol) and dendritic azide **6** (0.86 g, 1.16 mmol). R_f = 0.6 ($CHCl_3$: MeOH, 20:1); M.p.: 134-136 °C; ^{1}H NMR: (300 MHz, $CDCl_3$) δ = 4.12 (s, 2H), 4.16, 4.21, 4.27 (s, 36H; Cp), 5.06 (s, 8H), 5.14 (s, 4H), 5.28 (s, 8H), 5.39 (s, 4H), 6.46 (s, 4H), 6.53 (s, 3H), 6.56 (s, 2H), 7.51 (s, 4H), 7.59 (s, 2H). ^{13}C NMR: (75 MHz, $CDCl_3$) δ = 50.1, 54.1, 54.6, 62.0, (68.6, 68.8, 68.9, 69.1, Cp), 80.7, 101.7, 102.0, 107.5, 122.4, 123.1, 133.5, 136.8, 137.8, 143.3, 144.1, 159.6, 159.8 .MS (EI): *m/z* = 1687 [MALDI-TOF]. Elemental Anal.Calcd for $C_{83}H_{77}Fe_4N_{21}O_6$: C, 50.06; H, 4.60; N, 17.43%. Found: C, 49.99; H, 4.44; N, 17.37 %.



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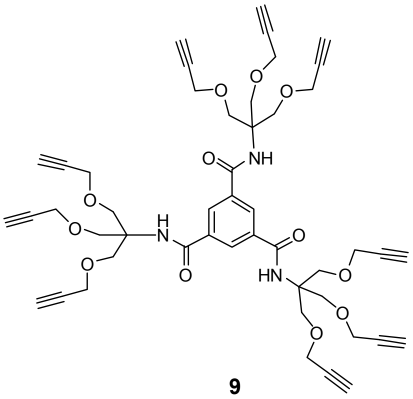
TRIS acetylene terminated dendron 9:



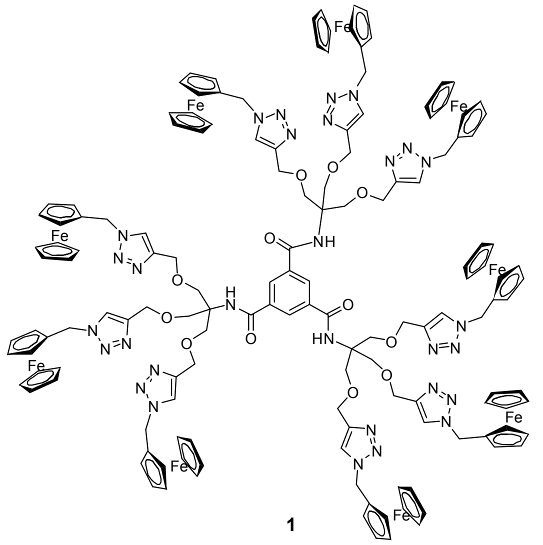
9

To a solution of *N*-(*t*-Butyloxycarbonyl)tris[(propargyloxy)methyl]aminomethane **8** (3g, 8.94 mmol) in dry CH_2Cl_2 (50 mL), cooled to 0 °C was added dropwise trifluoroacetic acid (15 mL, 197 mmol) over a period of 30 min. and the brown mixture was stirred at room temperature for 2 h. The mixture was then concentrated to dryness *in vacuo* with rotary evaporator using toluene as a co-solvent (2 X 3 mL). The solid obtained without further purification was dissolved in dry CH_2Cl_2 (50 mL) and the solution was cooled to 0 °C. Et_3N (1.3 mL, 18.6 mmol) and a solution of 1,3,5-benzenetricarboxylic acid chloride (0.55 g, 2.55 mmol) in dry CH_2Cl_2 (30 mL) were added. The mixture was allowed to warm up to room temperature and stirred under a nitrogen atmosphere for 15 h. The dark solution was washed with 0.5 M HCl (100 mL) and water (3 X 100 mL) and the organic layer was then collected, dried over Na_2SO_4 and concentrated to dryness. Purification by column chromatography (SiO_2) afforded **9** as a light brown solid. ($CHCl_3$/MeOH 99.3:0.7). Yield: 58%; M.p.: 96 °C; ^1H NMR: (300 MHz, $CDCl_3$) $\delta = 2.54$ (t, 9H, $J = 2.1$), 4.00 (s, 18H), 4.19 (d, 18H, $J = 2.4$), 6.64 (s, 3H), 8.58 (s, 3H). ^{13}C NMR: (75 MHz, $CDCl_3$) $\delta = 58.7$, 60.1, 68.4, 75.1, 79.6, 131.3, 135.9, 165.9. MS (EI): $m/z = 861$ [M^+]. Elemental Anal.Calcd for $C_{48}H_{51}N_3O_{12}$: C, 66.89; H, 5.96; N, 4.88 %. Found: C, 66.75; H, 5.84; N, 4.82 %.

S2: Spectral data for dendrimers

Ferrocenyldendrimer 1:

Following the general procedure B, the ferrocenyldendrimer **1** was obtained as white from TRIS acetylene terminated dendron **9** (0.07 g, 0.08 mmol) and azidomethyl ferrocene **4** (0.19 g, 0.79 mmol). Yield: 94%; R_f = 0.55 ($CHCl_3$: MeOH, 20:3); M.p.: 110-112 °C; ^{1}H NMR: (300 MHz, $CDCl_3$) δ = 3.89 (s, 18H), 4.14-4.15 (m, 63H), 4.26 (t, 18H, *J* 1.5), 4.54 (s, 18H), 5.22 (s, 18H), 7.14 (s, 3H), 7.05 (s, 9H), 8.42 (s, 3H). ^{13}C NMR: (75 MHz, $CDCl_3$) δ = 49.9, 60.5, 64.7, 68.9, 69.0, 81.19, 122.33, 131.0, 135.9, 144.6, 166.2. MS (MALDI-TOF): *m/z* = 3054 [M^++Na]. Elemental Anal.Calcd for $C_{147}H_{150}Fe_9N_{30}O_{12}$: C, 58.24; H, 4.99 N, 13.86 %. Found: C, 58.09; H, 4.88; N, 13.73 %.



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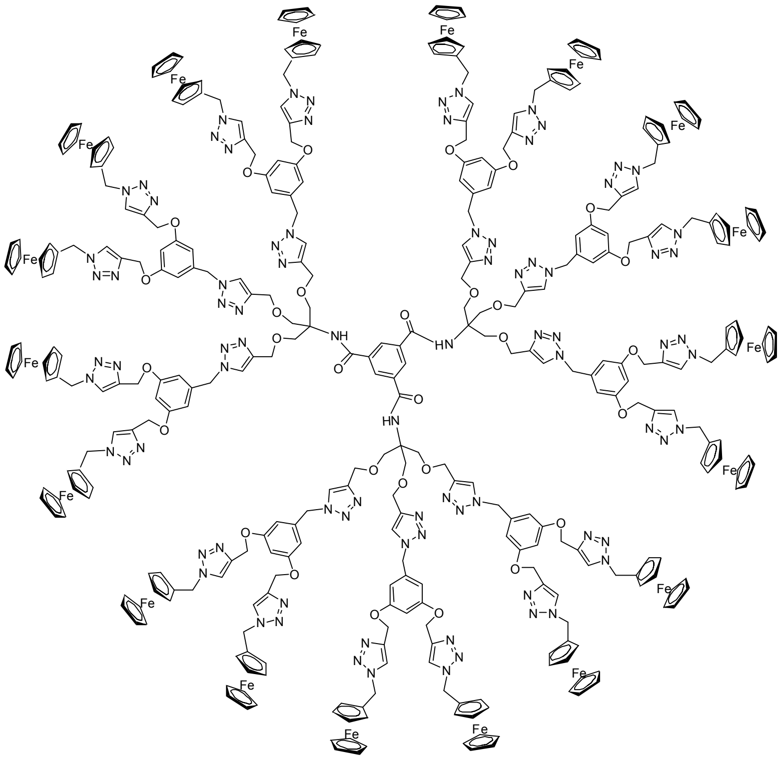
Ferrocenyldendrimer 2:

Following the general procedure B, the ferrocenyldendrimer **2** was obtained as white solid from TRIS acetylene terminated dendron **9** (0.03 g, 0.03 mmol) and dendritic azide **6** (0.26 g, 0.03 mmol). Yield: 89%; R_f = 0.6 ($CHCl_3$: MeOH, (25:3); M.p.: 126-

128°C; ^{1}H NMR: (300 MHz, $CDCl_3$) δ = 3.85 (s, 18H), 4.14, 4.17, 4.25 (s, 162H, Cp), 4.49 (s, 18H), 4.83-4.97 (m, 36H), 5.23 (s, 36H), 5.29 (s, 18H), 6.45 (s, 27H), 7.19 (m, 3H), 7.53 (s, 18H), 7.61 (s, 9H), 8.40 (s, 3H). ^{13}C NMR: (75 MHz, $CDCl_3$) δ = 48.7, 50.1, 53.8, 61.8, 64.7, (68.9, 69.0, 69.1, Cp), 80.8, 101.9, 107.3, 122.7, 123.2, 137.3, 143.1, 143.2. 145.1, 159.0, 159.6. MS (MALDI): *m/z* = 7394 [M$^+$+Na] Elemental Anal.Calcd for $C_{363}H_{348}Fe_{18}N_{84}O_{30}$: C, 59.14; H, 4.76; N, 15.96 %. Found: C, 59.00; H, 4.57; N, 15.84 %.



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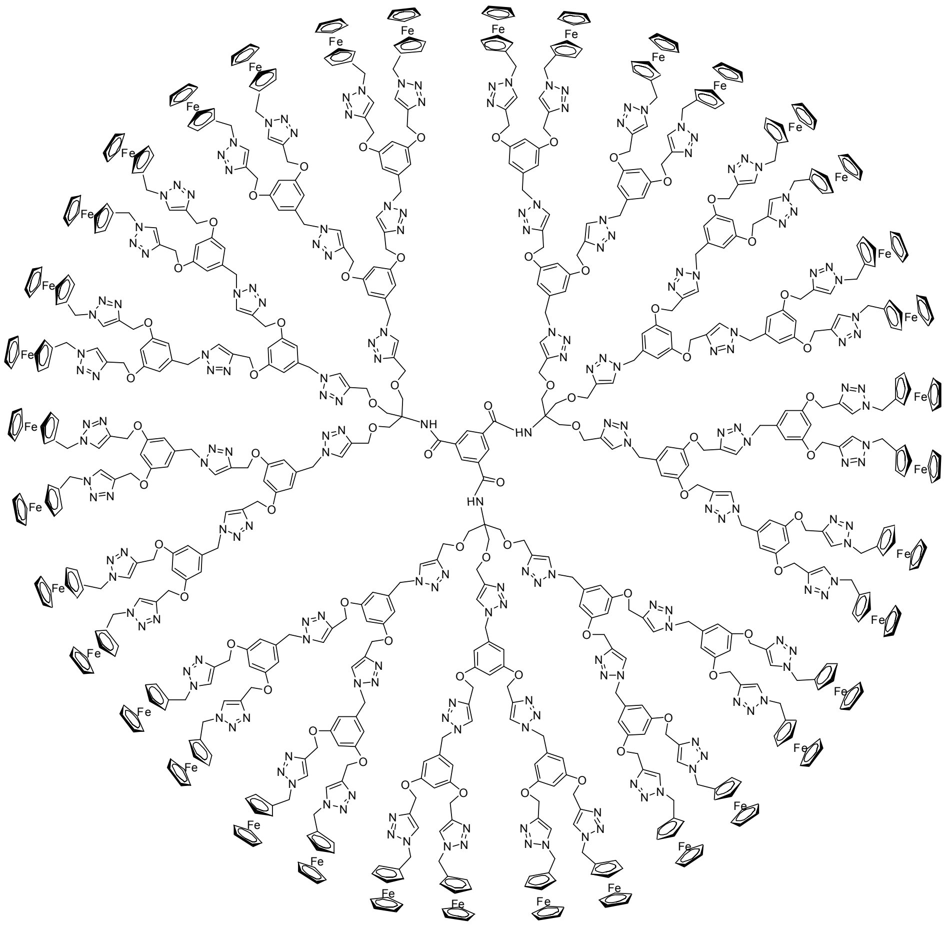
Ferrocenyldendrimer 3:

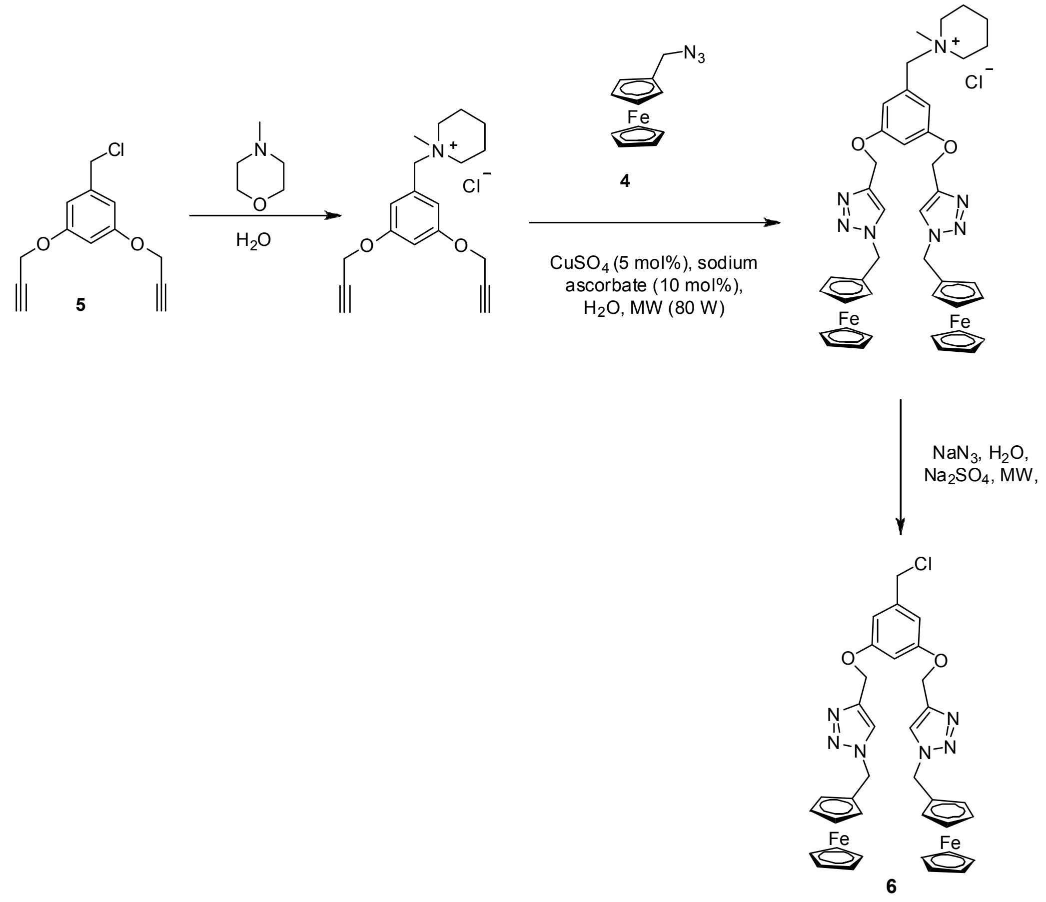
Following the general procedure B, the ferrocenyldendrimer **3** was obtained as white solid from TRIS acetylene terminated dendron **9** (0.007 g, 0.008 mmol) and dendritic azide **7** (0.14 g, 0.08 mmol). Yield: 80%; R_f = 0.59 ($CHCl_3$: MeOH, 25:4); M.p.:

147-149°C; ^{1}H NMR: (300 MHz, $CDCl_3$) δ = 3.81 (s, 18H), 4.12, 4.23, 4.28 (s, 324H; Cp), 4.39 (s, 18H), 4.91-4.95 (m, 108H), 5.22-5.26 (m, 126H), 6.39-6.44 (m, 81H), 7.05 (s, 3H), 7.56 (s, 36H), 7.61 (s, 27H), 8.30 (s, 3H). ^{13}C NMR: (75 MHz, $CDCl_3$) δ = 50.1, 53.8, 54.6, 61.8, (68.9, 69.0, 69.1, Cp), 69.7, 73.2, 80.9, 81.8, 101.9, 107.4, 107.5, 114.1, 122.72, 123.5, 128.9, 133.6, 137.1, 137.3, 139.3, 143.2, 143.4, 143.6, 159.5, 159.7. MS (MALDI): *m/z* = 16077 [M$^+$+Na]. Elemental Anal.Calcd for $C_{795}H_{744}Fe_{36}N_{192}O_{66}$: C, 59.14; H, 4.76; N, 15.96 %. Found: C, 59.00; H, 4.57; N, 15.84 %.



3

S3: Role of N-methylmorpholine as IL in the synthesis of dendritic arm.



S4: Cyclic voltametry experiments

All the cyclic voltametry experiments were carried out with the CHI model 1100A series electro chemical analyzer (CH instrument, USA) controlled by an Intel Pentium 4 personal computer with standard three-electrode configuration.

Electro chemical cells

The electrochemical cell was a conventional three-compartment glass cell. A fritted disk of maximum porosity separated the working electrode compartment and the counter electrode compartment. The top lid of the working electrode compartment was provided with entry ports for the working electrode, nitrogen gas inlet, nitrogen gas outlet and the reference electrode. The reference electrode compartment was connected to the working electrode compartment by means of a tightly fitting glass tube ending with a luggin capillary. A three-way glass stopper fused at the middle of the glass tube arrangement prevented the solution leaking into the test solution. Glassy carbon disc of 3 mm diameter with geometric area of 0.0707 cm^2 was used as a support for the working electrode. Glassy carbon electrode (GCE) surface was conditioned by polishing with increasingly finer grade alumina powders (1, 0.3 and 0.5 micron) down to mirror polish, sonicated about 1 to 2 minutes in double distilled (DD) water, degreased with acetone, washed with copious amount of DD water. This is followed by potential cycling for five times in the deaerated base electrolyte in the potential region -200 to 1000 mV (SCE) at a potential scan (v)=100 mVs^{-1}. In all the electrochemical experiments the potentials were measured with respect to a dip type (ELICO, India) saturated calomel electrode (SCE). Saturated KCl solution of the SCE was changed periodically. A Pt wire in the form of a spiral with high geometrical surface area (~ 20 cm^2) was used as a counter electrode. The electrode was cleaned in conc.HNO_3 and then heated to red hotness in a blue flame. This treatment was given occasionally. The redox potentials and the value of internal standard $[FeCp_2]/[FeCp_2]^+$ was measured in CH_2Cl_2 containing the supporting electrolyte $[n\text{-}Bu_4N][PF_6]$.

S5: Synthesis of Au nanoparticles with dendrimers 1,2 and 3

The general procedure adopted for the synthesis of Au nanoparticles using dendrimer **1**: In a typical synthesis, 3.298×10^{-4} mmol (1 mg) of dendrimer **1** was dissolved in mixture of $CHCl_3$ and methanol (MeOH) with a ratio of 2:1 (2 mL), and the reaction mixture was allowed to stirring at room temperature under nitrogen atmosphere. After complete solubilization, Auric acetate (4.429×10^{-3} mmol) dissolved in methanol (2 mL) was added slowly into the reaction mixture inorder to anchor Au (III) ions within the cores of the dendrimer. The stoichiometric amount of Au atoms was optimized (9, 27 and 63 equiv of Au per dendrimer for **1**,**2** and **3**) while excess equivalents number of Au atoms per triazole exceeds number of Au^0 get precipitated. It is earlier reported that, Au nanoparticles formed would contain the number of atoms equal to the number of triazole rings present in the dendrimer. Then $NaBH_4$ (1.16 mg, 4.429×10^{-2} mmol) was added drop wise and the yellow color of the reaction solution turned to wine red indicating the formation of Au nanoparticles.

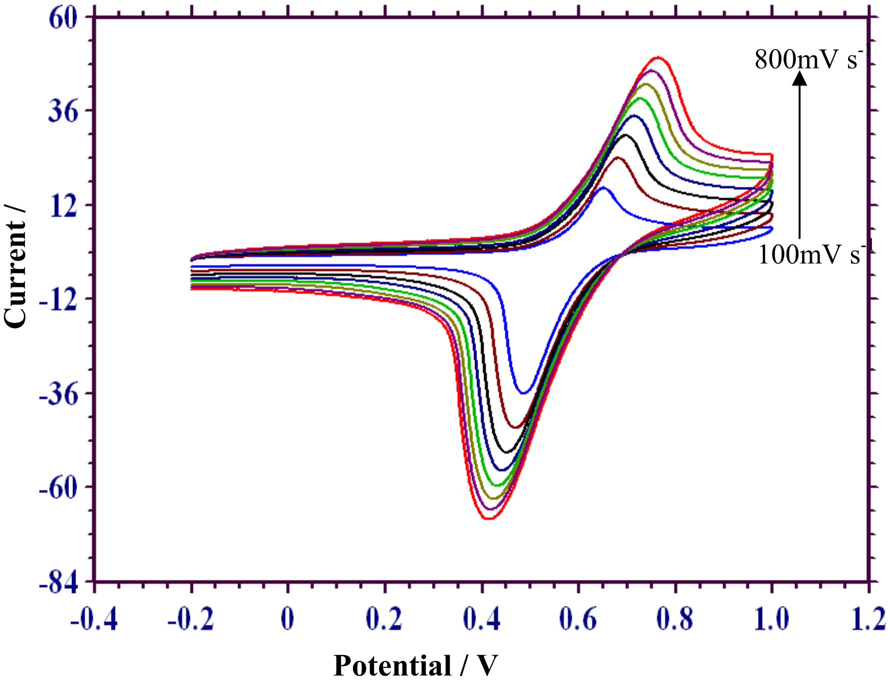


Figure S1: Ferrocenyldendrimer **1** for various scan rates **(**From inner to outer at 100 mV/s, 200 mV/s, 300 mV/s, 400 mV/s, 500 mV/s, 600 mV/s 700 mV/s and 800 mV/s)

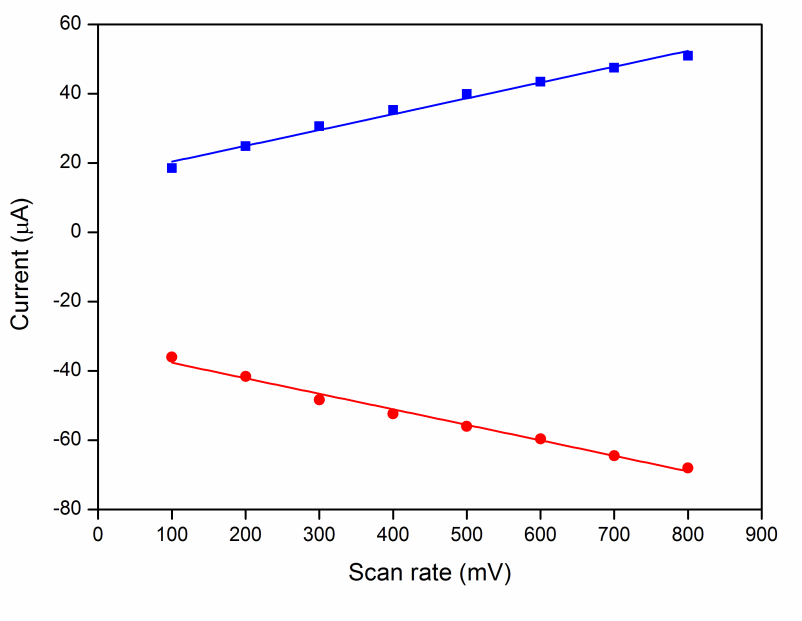


Figure S2: Intensity vs. scan rate of the effect with ferrocenyldendrimer **1**

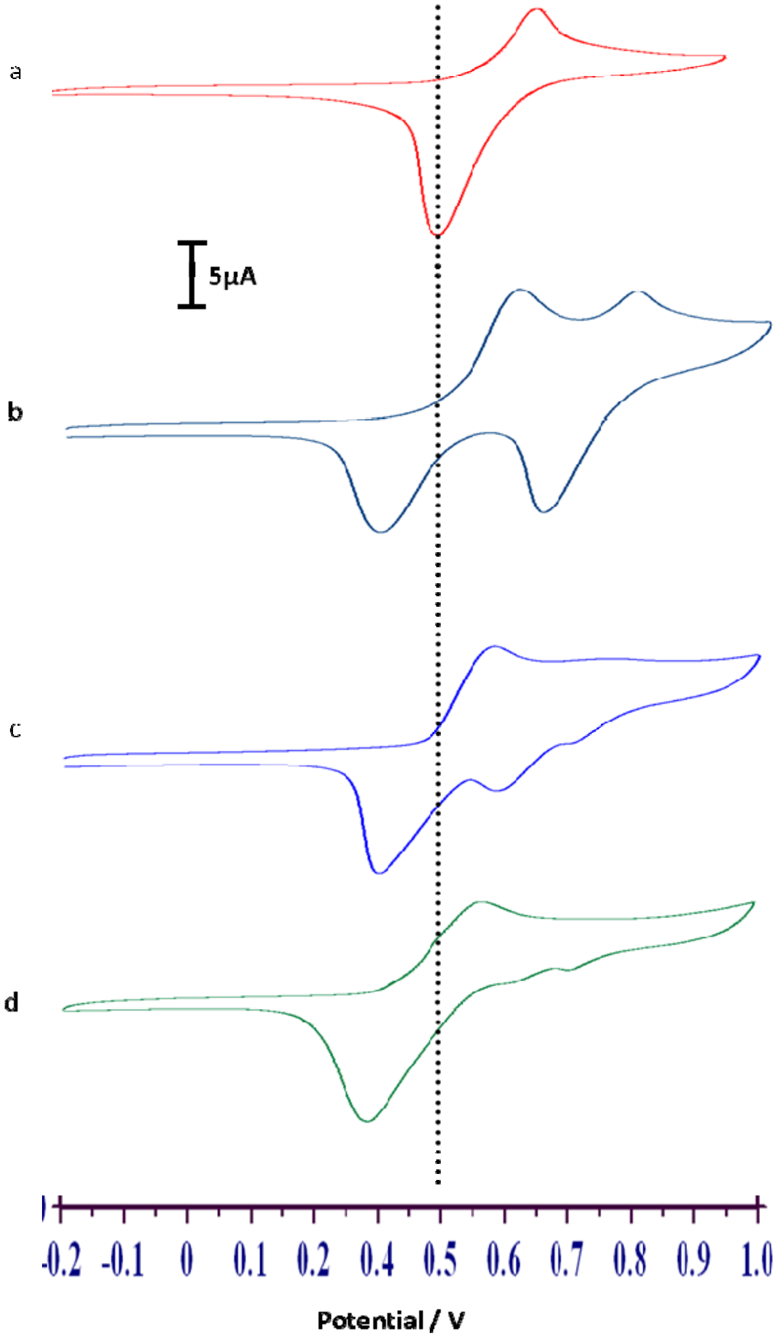


Figure S3a: Cyclic voltammetric redox sensing of anion on dendrimer **1** (C = 9.82×10^{-4} M): (a) before addition of $H_2PO_4^{2-}$; (b & c) during addition and of $H_2PO_4^{2-}$ and (d) at the end of addition of $H_2PO_4^{2-}$.

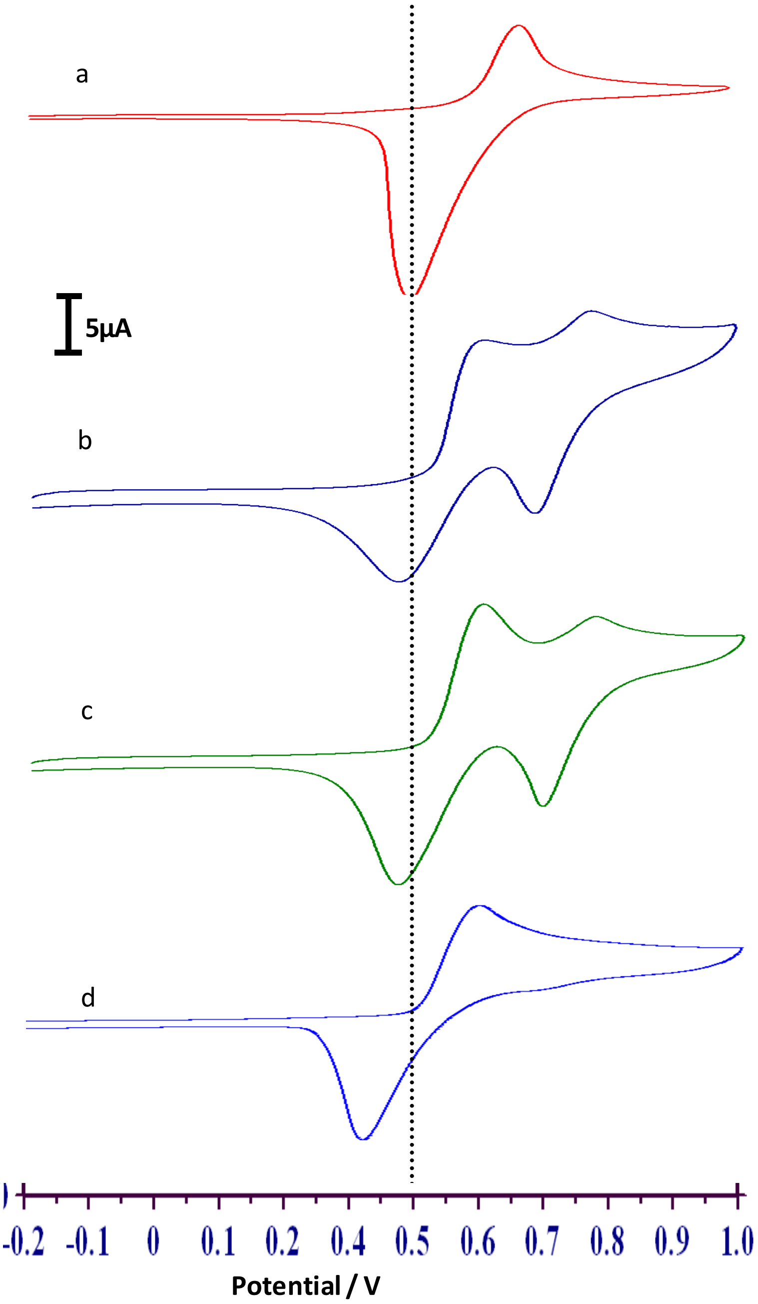


Figure S3b: Cyclic voltammetric redox sensing of anion on dendrimer **2** (C = 1.00x10^{-3} M): (a) before addition of $H_2PO_4^-$; (b & c) during addition and of $H_2PO_4^-$ and (d) at the end of addition of $H_2PO_4^-$.

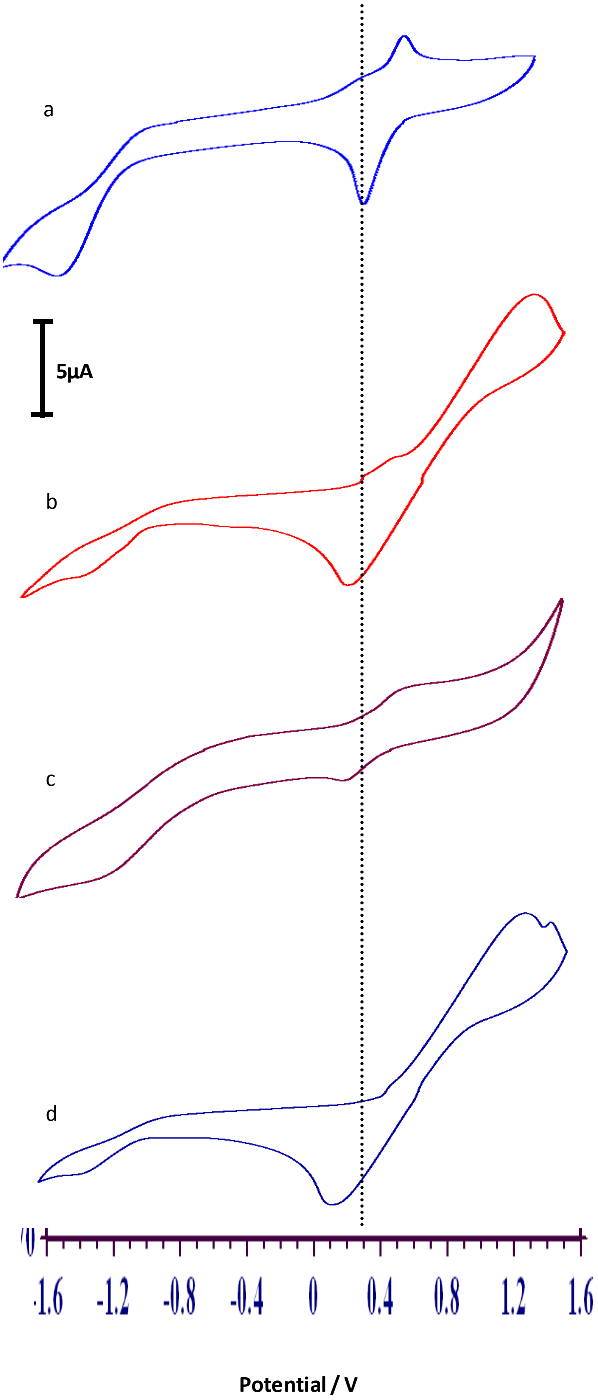


Figure S3c: Cyclic voltammetric redox sensing of anions on dendrimer **3** (C = 4.97x10^{-4} M): (a) before addition of $H_2PO_4^-$; (b & c) during addition and of $H_2PO_4^-$ and (d) at the end of addition of $H_2PO_4^-$.

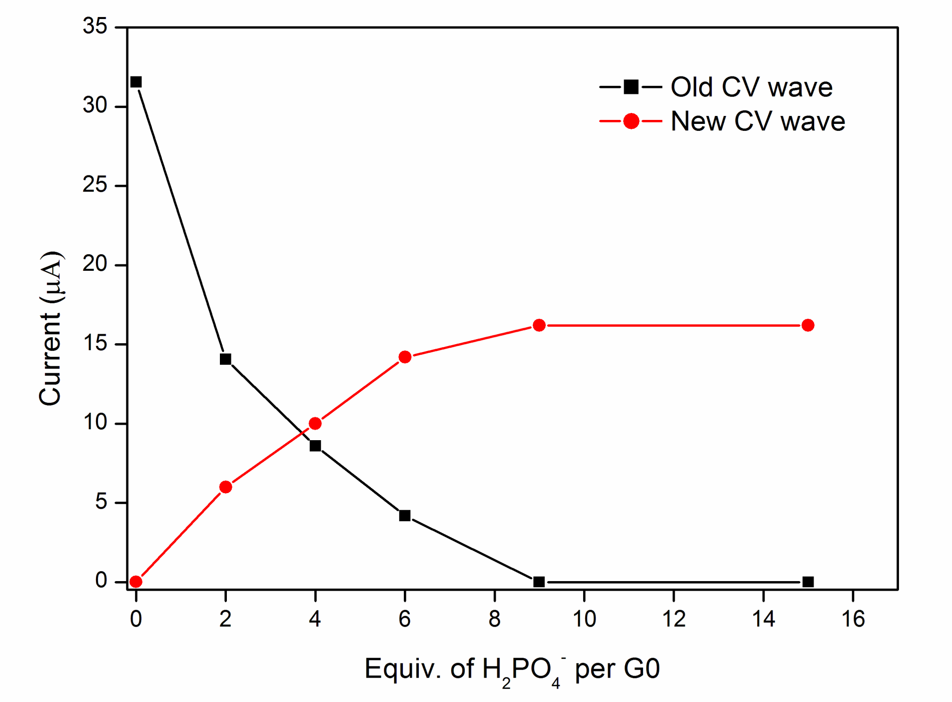


Figure S4a: Titration of [*n*-Bu4N]2[ATP] with the 9-ferrocenyl dendrimer **1** by cyclic voltammetry

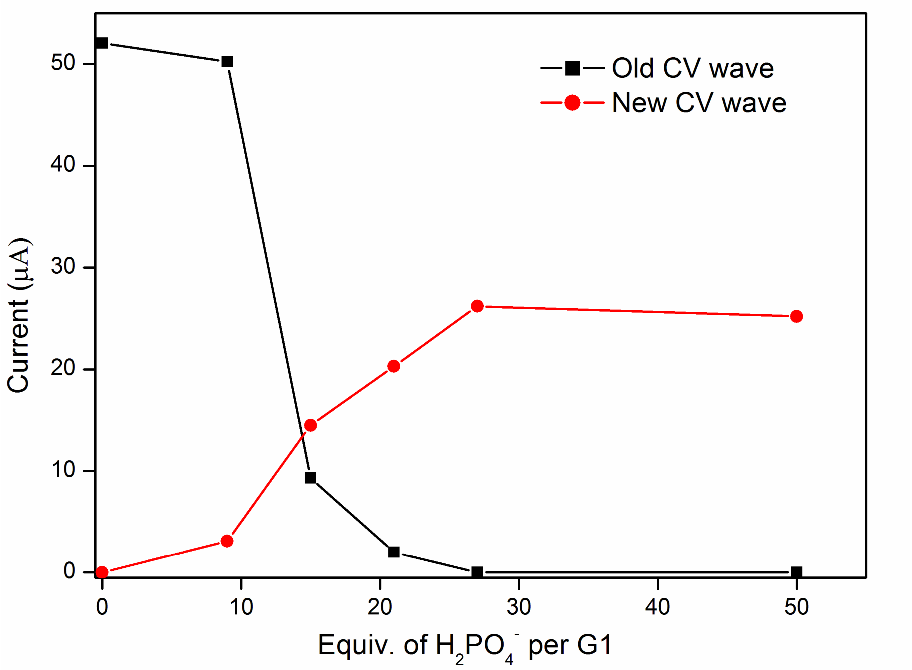


Figure S4b: Titration of [*n*-Bu4N]2[ATP] with the 27-ferrocenyl dendrimer **2** by cyclic voltammetry

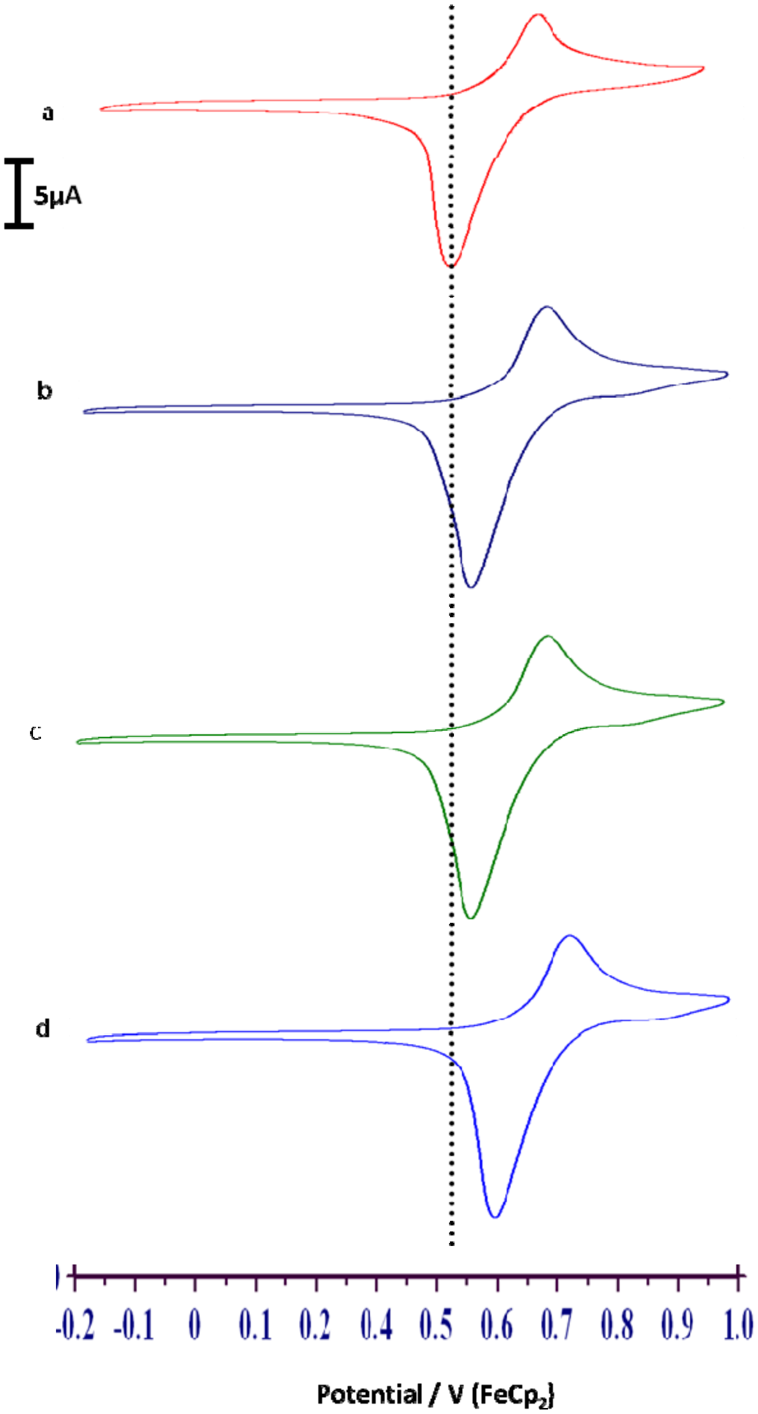


Figure S5a: Cyclic voltammetric redox sensing of cation on dendrimer **1** (C = $9.82x10^{-4}$ M): (a) before addition of $Pd(PPh_3)_2Cl_2$; (b & c) during addition and of $Pd(PPh_3)_2Cl_2$ and (d) at the end of addition of $Pd(PPh_3)_2Cl_2$.

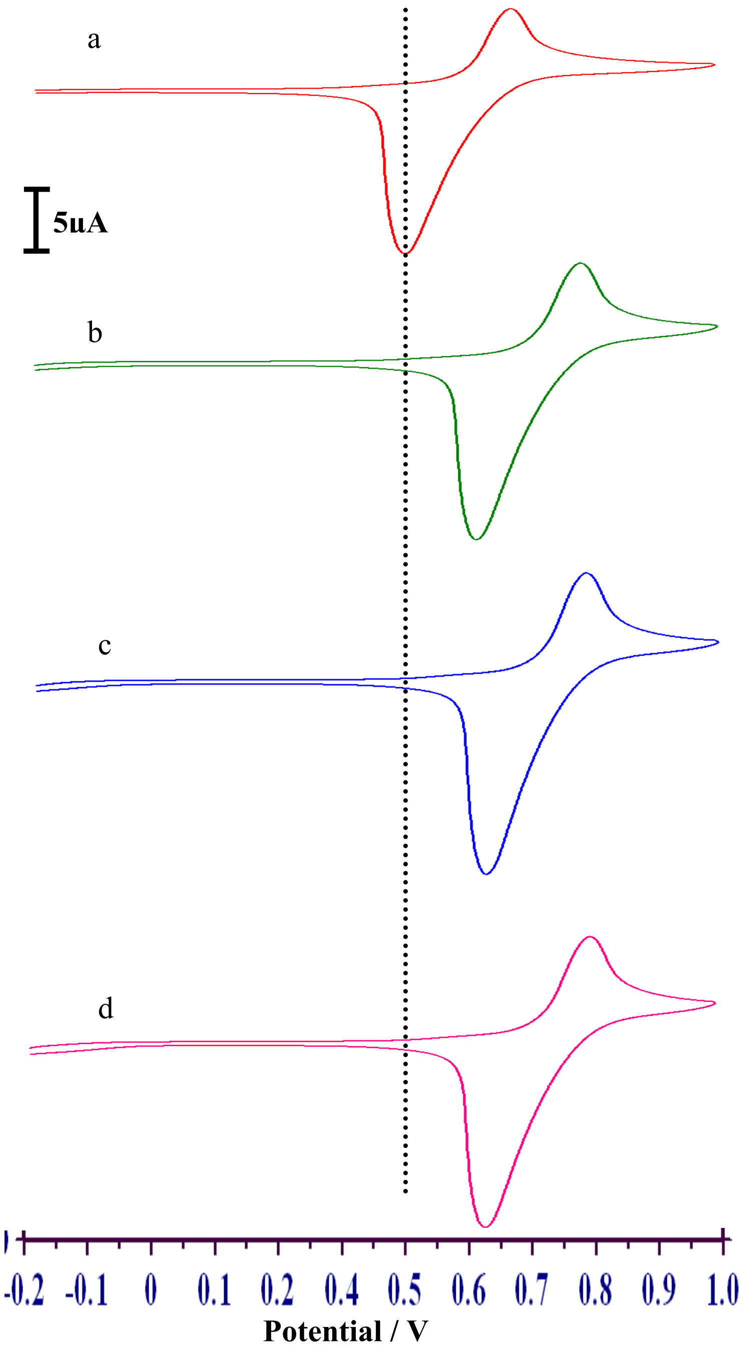


Figure S5b: Cyclic voltammetric redox sensing of cation on dendrimer **2** (C = 1.00×10^{-3} M): (a) before addition of $Pd(PPh_3)_2Cl_2$; (b & c) during addition and of $Pd(PPh_3)_2Cl_2$ and (d) at the end of addition of $Pd(PPh_3)_2Cl_2$.

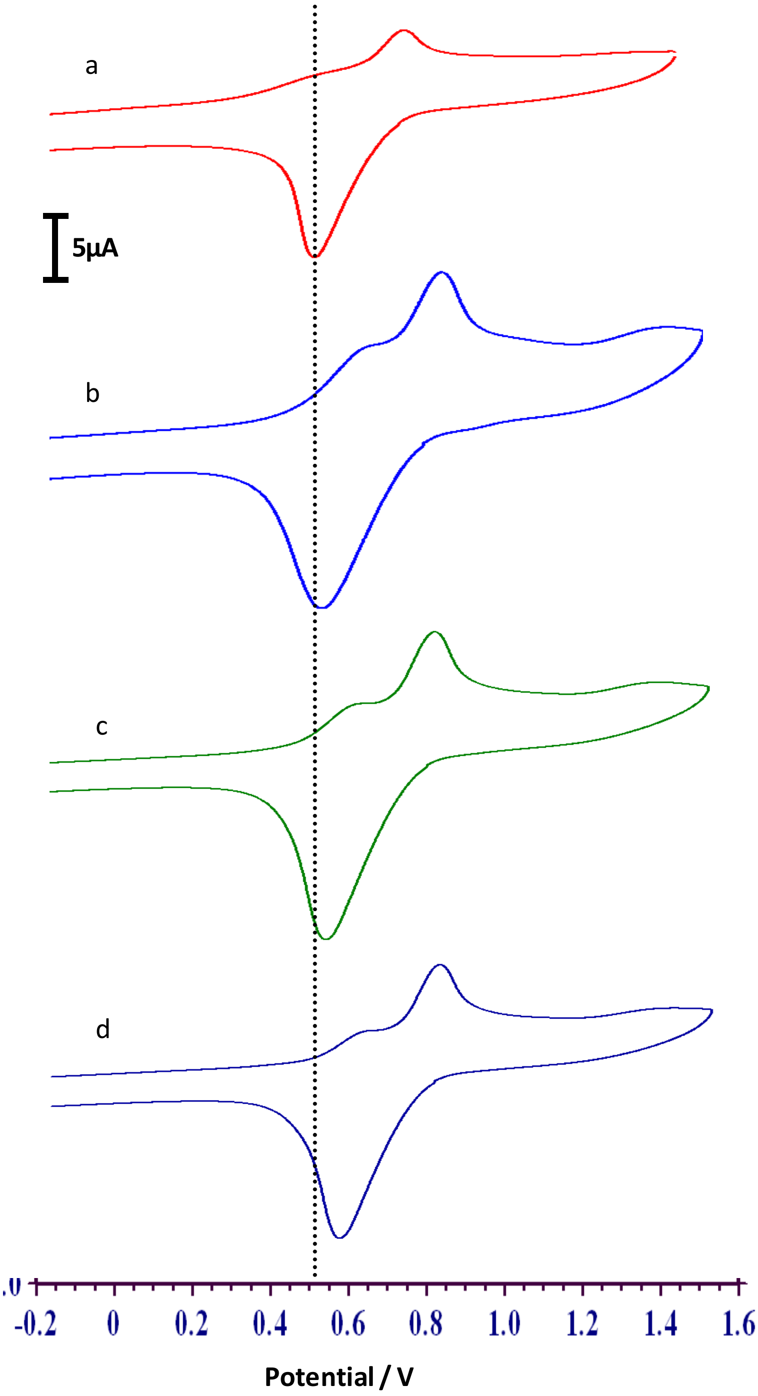


Figure S5c: Cyclic voltammetric redox sensing of cation of dendrimer **3** (C = 4.97x10^{-4} M): (a) before addition of Pd(PPh$_3$)$_2$Cl$_2$; (b & c) during addition and of Pd(PPh$_3$)$_2$Cl$_2$ and (d) at the end of addition of Pd(PPh$_3$)$_2$Cl$_2$.

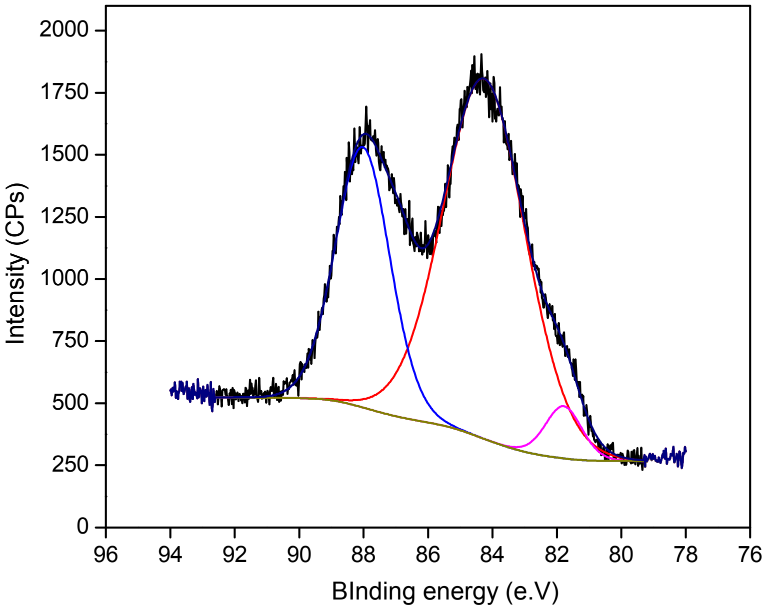
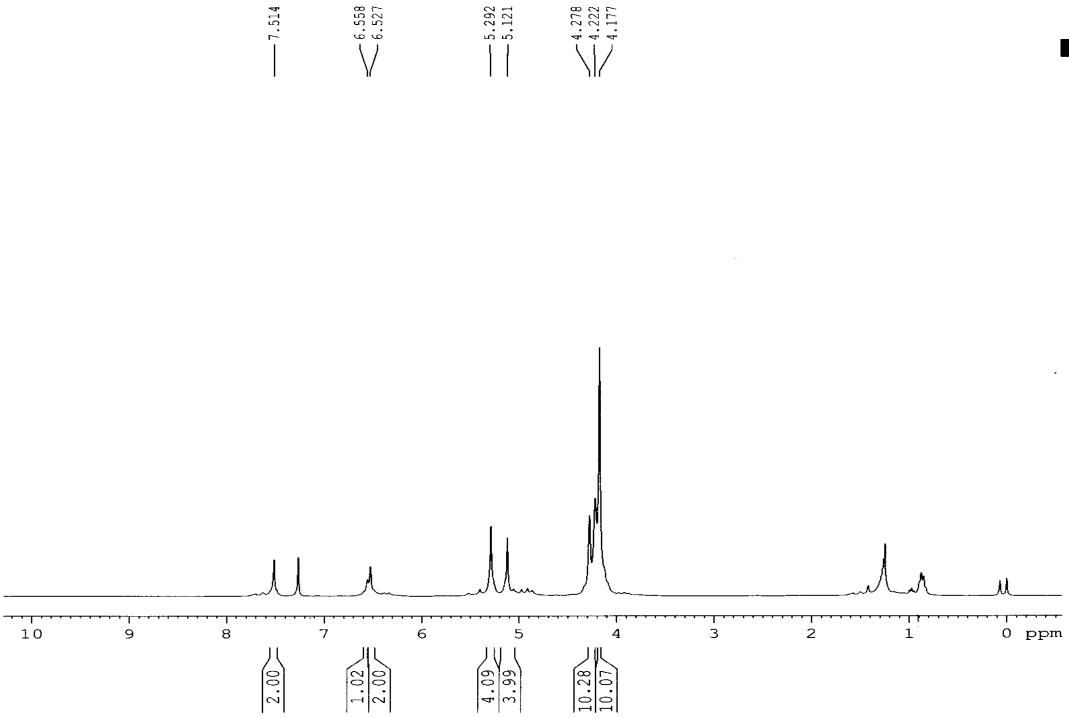


Figure S6: XPS spectrum of Au nanoparticles encapsulated by dendrimer **1**

S7: ^{1}H, ^{13}C NMR and Mass Spectral data of Synthesized Compounds



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DE                    6.00 usec
TE                   300.0 K
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TD0                      1

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PL1                   0.00 dB
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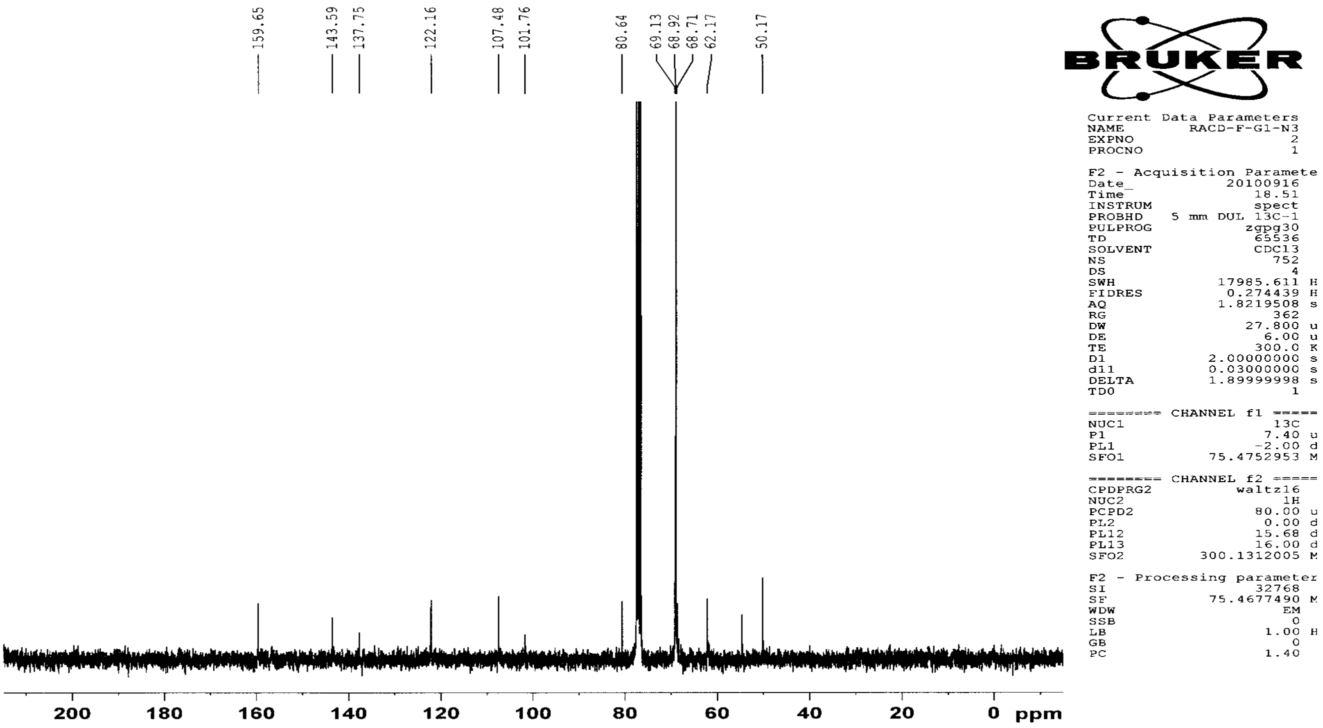
^{1}H NMR spectrum (300 MHz, CDCl$_3$) of dendritic azide 6



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F2 - Processing parameter
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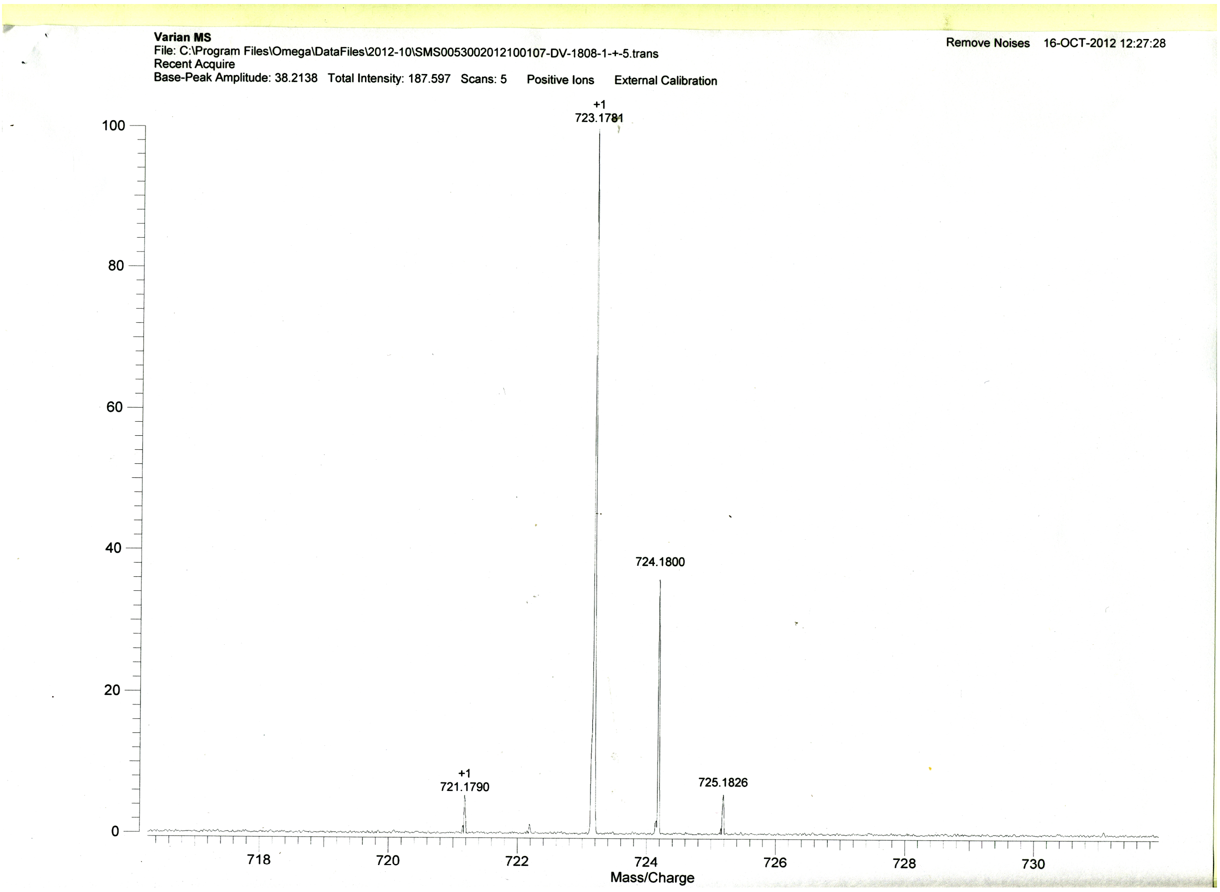
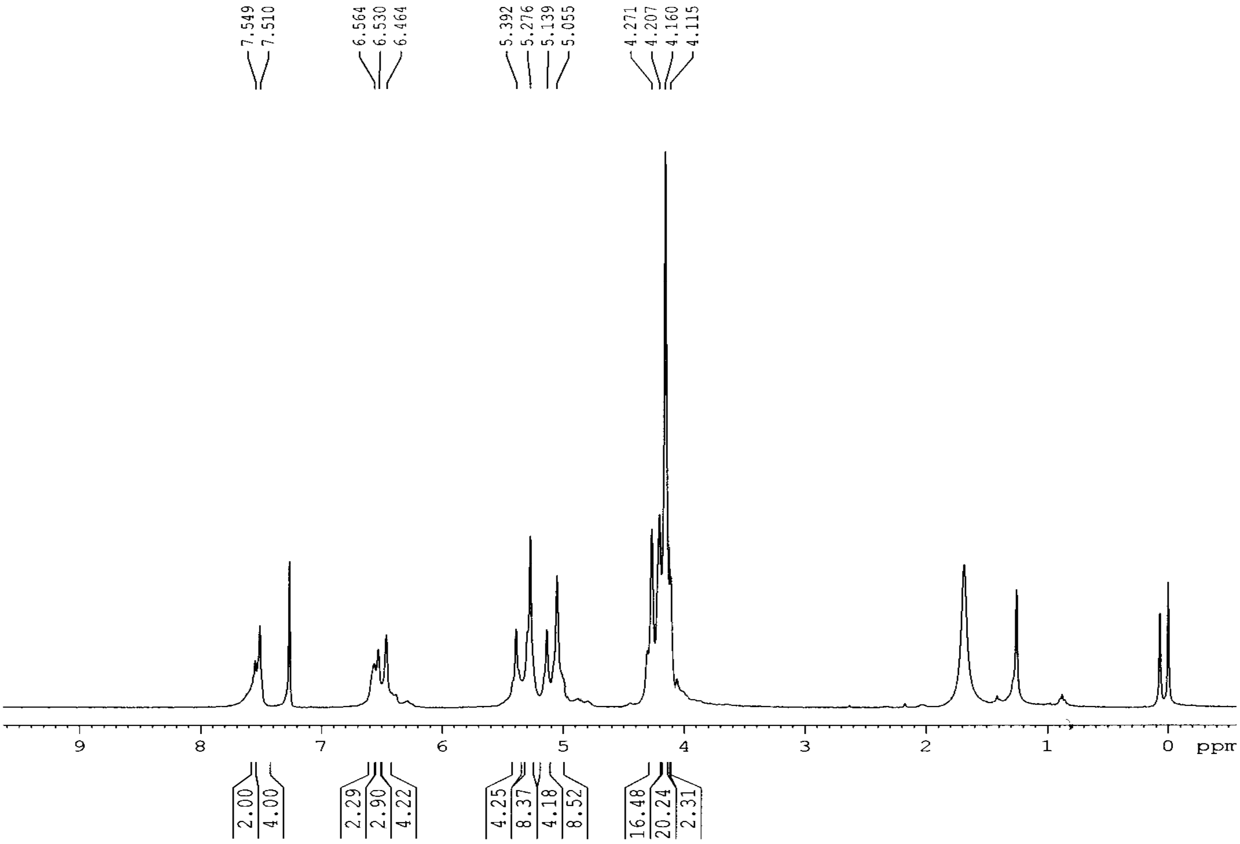
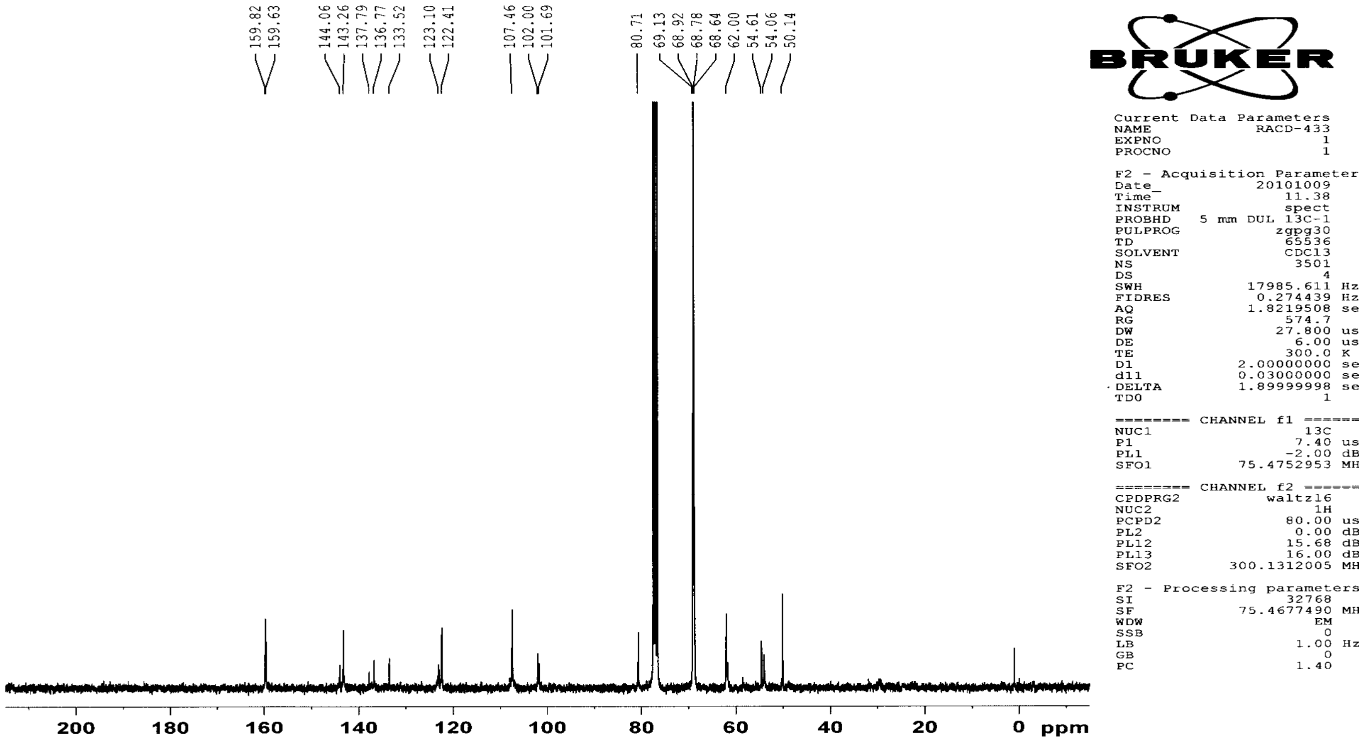
^{13}C NMR spectrum (75 MHz, $CDCl_3$) of dendritic azide 6



Mass spectrum (ESI) of dendritic azide 6

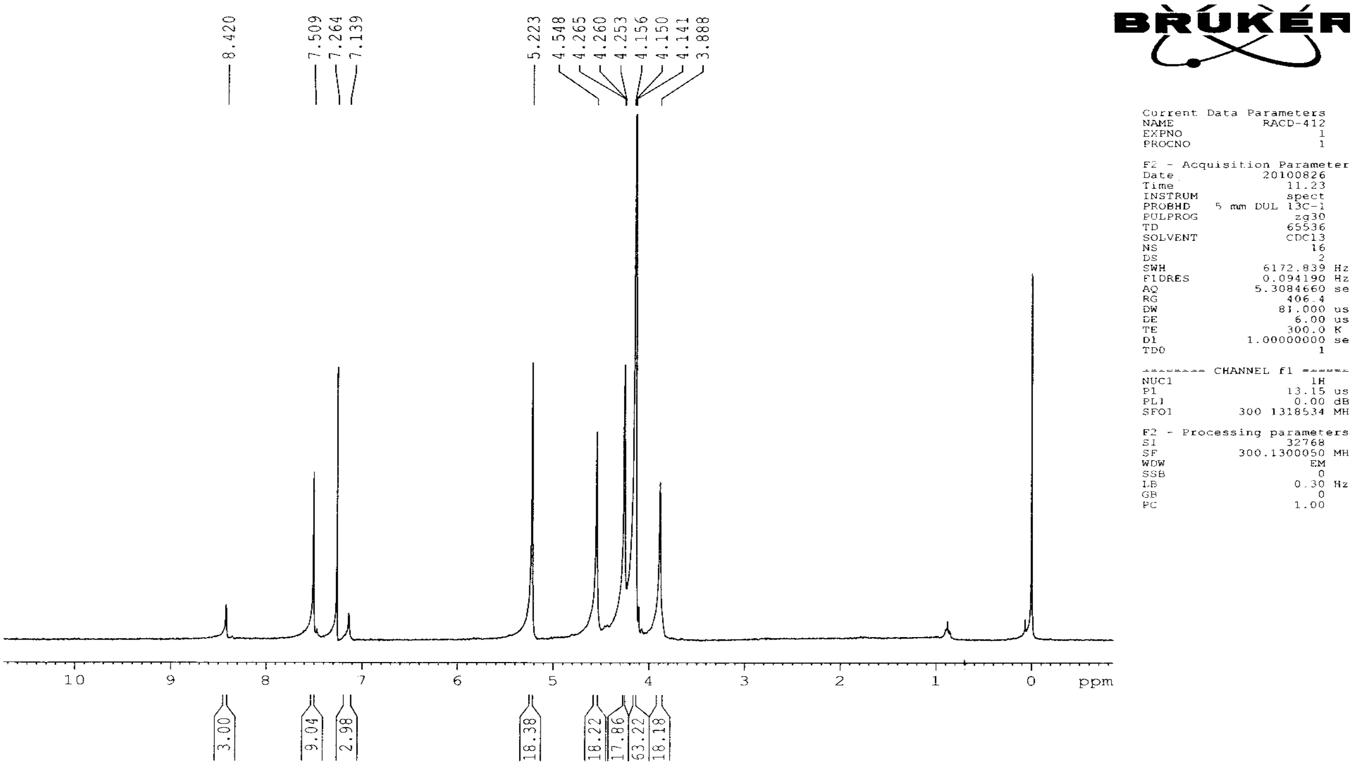


^{1}H NMR spectrum (300 MHz, CDCl$_3$) of dendritic azide 7



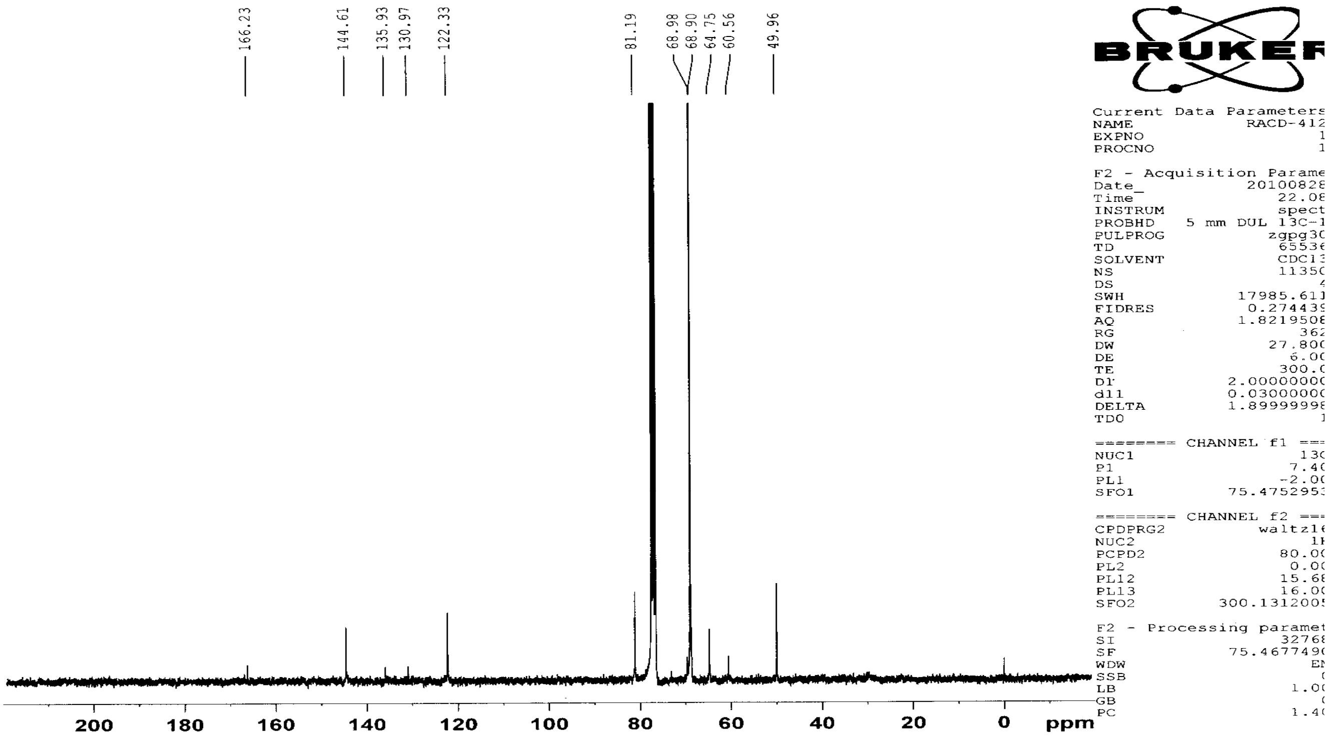
```
Current Data Parameters
NAME              RACD-433
EXPNO                    1
PROCNO                   1

F2 - Acquisition Parameter
Date_             20101009
Time                 11.38
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG            zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    3501
DS                       4
SWH              17985.611 Hz
FIDRES            0.274439 Hz
AQ               1.8219508 se
RG                   574.7
DW                  27.800 us
DE                    6.00 us
TE                   300.0 K
D1              2.00000000 se
d11             0.03000000 se
DELTA           1.89999998 se
TD0                      1

======== CHANNEL f1 ======
NUC1                   13C
P1                    7.40 us
PL1                  -2.00 dB
SFO1            75.4752953 MH

======== CHANNEL f2 ======
CPDPRG2            waltz16
NUC2                    1H
PCPD2                80.00 us
PL2                   0.00 dB
PL12                 15.68 dB
PL13                 16.00 dB
SFO2           300.1312005 MH

F2 - Processing parameters
SI                   32768
SF              75.4677490 MH
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```

^{13}C NMR spectrum (75 MHz, CDCl$_3$) of dendritic azide 7



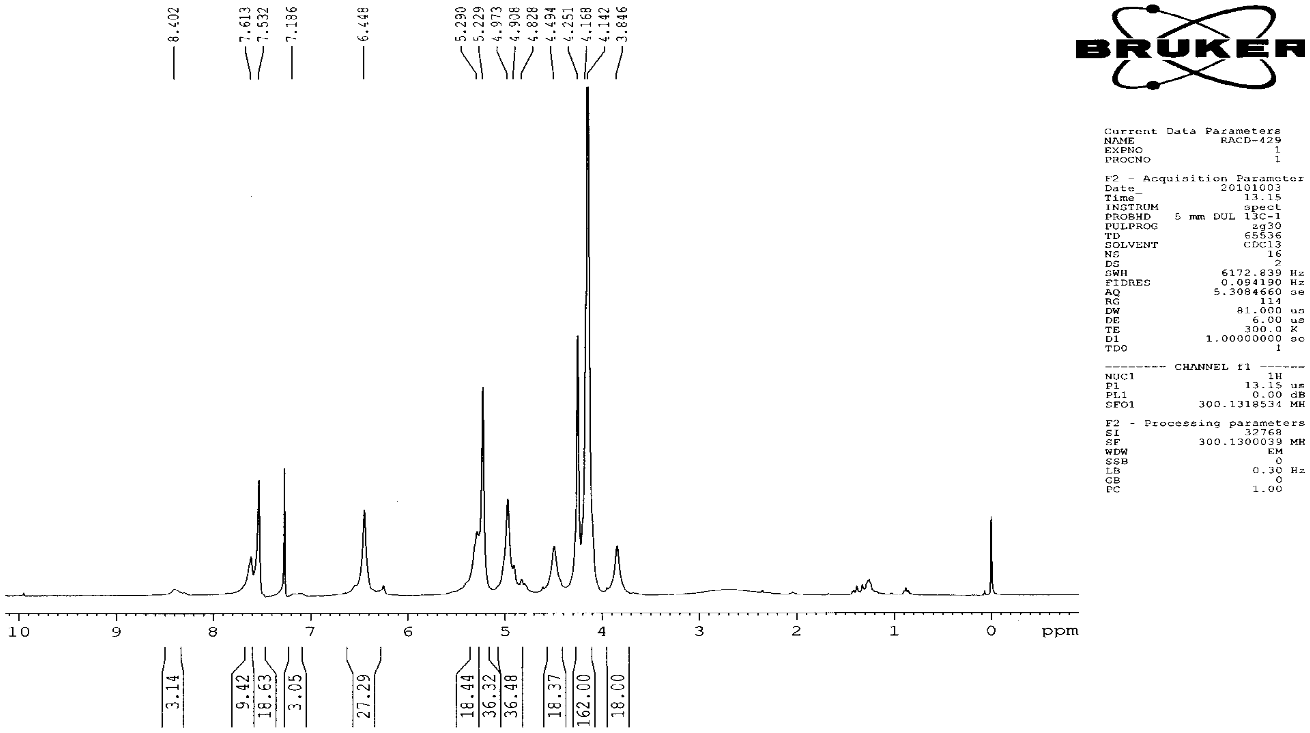
```
Current Data Parameters
NAME              RACD-412
EXPNO                    1
PROCNO                   1

F2 - Acquisition Parameter
Date              20100826
Time                 11.23
INSTRUM              spect
PROBHD     5 mm DUL 13C-1
PULPROG               zg30
TD                   65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH               6172.839 Hz
FIDRES            0.094190 Hz
AQ               5.3084660 se
RG                   406.4
DW                  81.000 us
DE                    6.00 us
TE                   300.0 K
D1              1.00000000 se
TD0                      1

======== CHANNEL f1 ======
NUC1                    1H
P1                   13.15 us
PL1                   0.00 dB
SFO1          300 1318534 MH

F2 - Processing parameters
SI                   32768
SF             300.1300050 MH
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```

^{1}H NMR spectrum (300 MHz, $CDCl_3$) of ferrocenyldendrimer 1

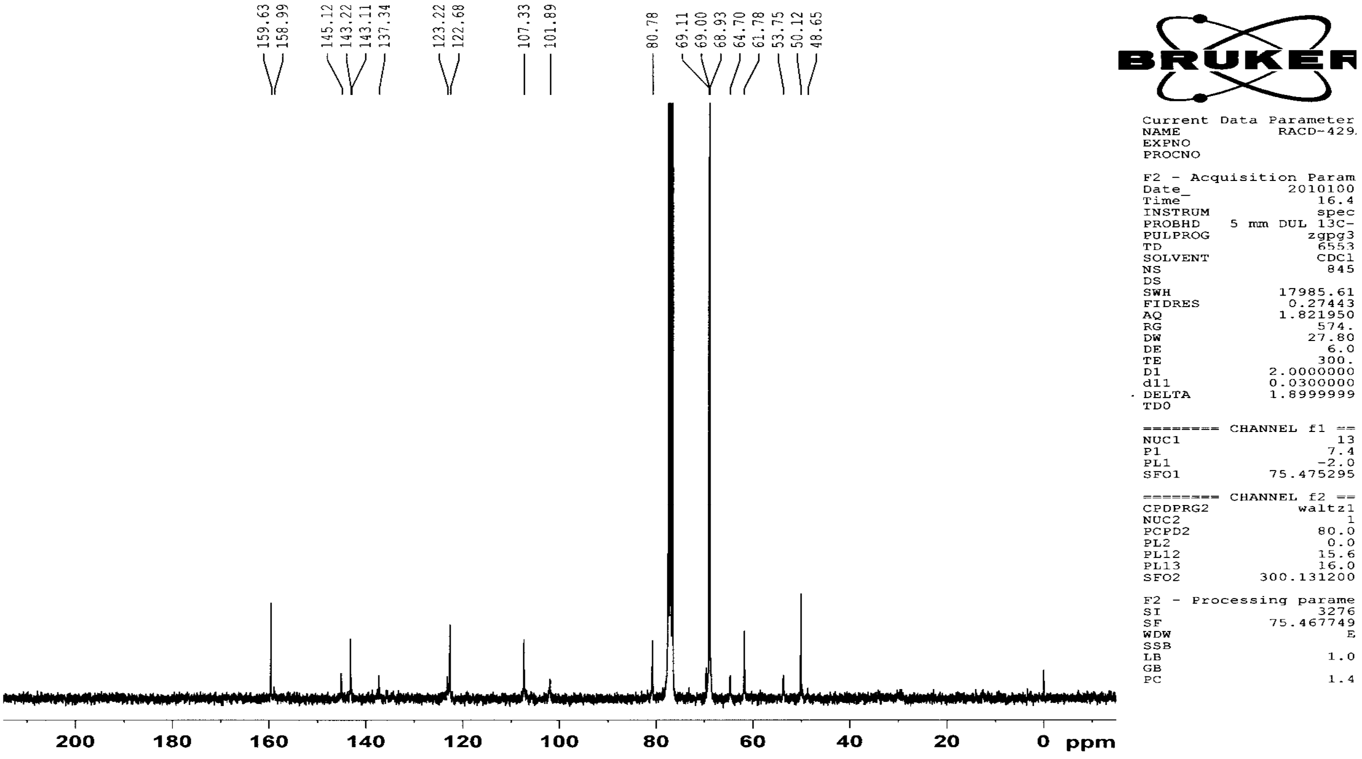


```
Current Data Parameters
NAME              RACD-412
EXPNO                    1
PROCNO                   1

F2 - Acquisition Parame
Date_             20100828
Time                 22.08
INSTRUM              spect
PROBHD   5 mm DUL 13C-1
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                   11350
DS                       4
SWH              17985.611
FIDRES            0.274439
AQ               1.8219508
RG                     362
DW                  27.800
DE                    6.00
TE                   300.0
D1              2.00000000
d11             0.03000000
DELTA           1.89999998
TD0                      1

======== CHANNEL f1 ===
NUC1                   13C
P1                    7.40
PL1                  -2.00
SFO1            75.4752953

======== CHANNEL f2 ===
CPDPRG2            waltz16
NUC2                    1H
PCPD2                80.00
PL2                   0.00
PL12                 15.68
PL13                 16.00
SFO2           300.1312005

F2 - Processing paramet
SI                   32768
SF              75.4677490
WDW                     EM
SSB                      0
LB                    1.00
GB                       0
PC                    1.40
```

^{13}C NMR spectrum (75 MHz, CDCl$_3$) of ferrocenyldendrimer 1

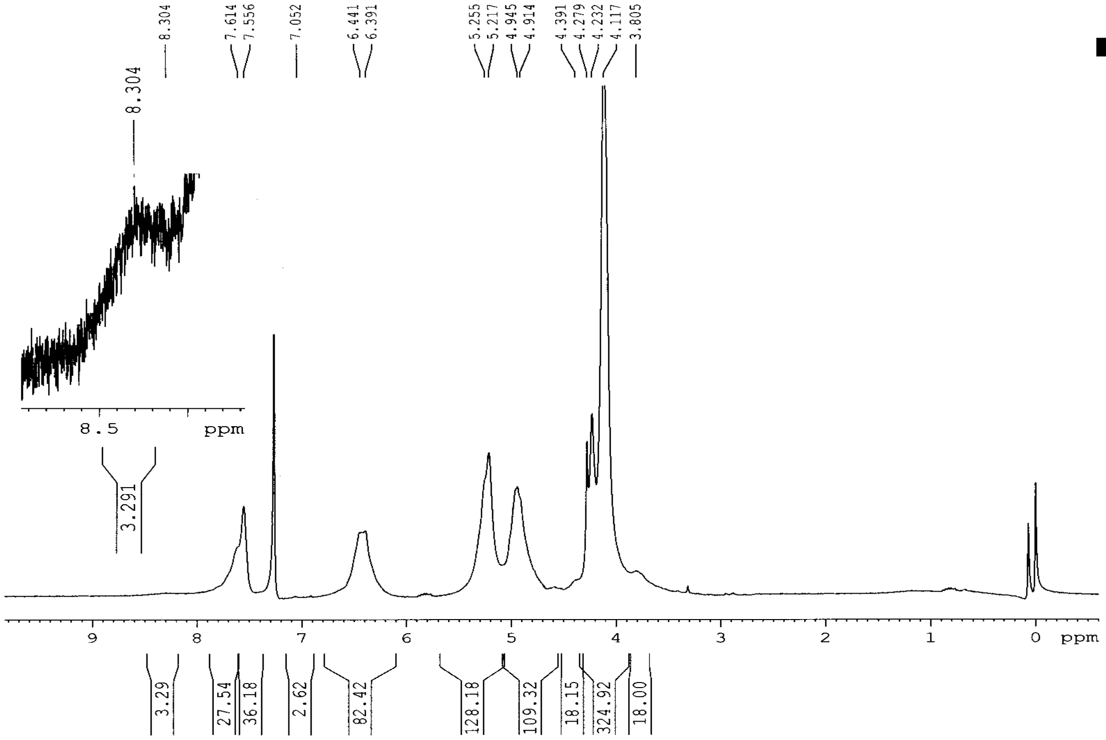


^{1}H NMR spectrum (300 MHz, $CDCl_3$) of ferrocenyldendrimer 2



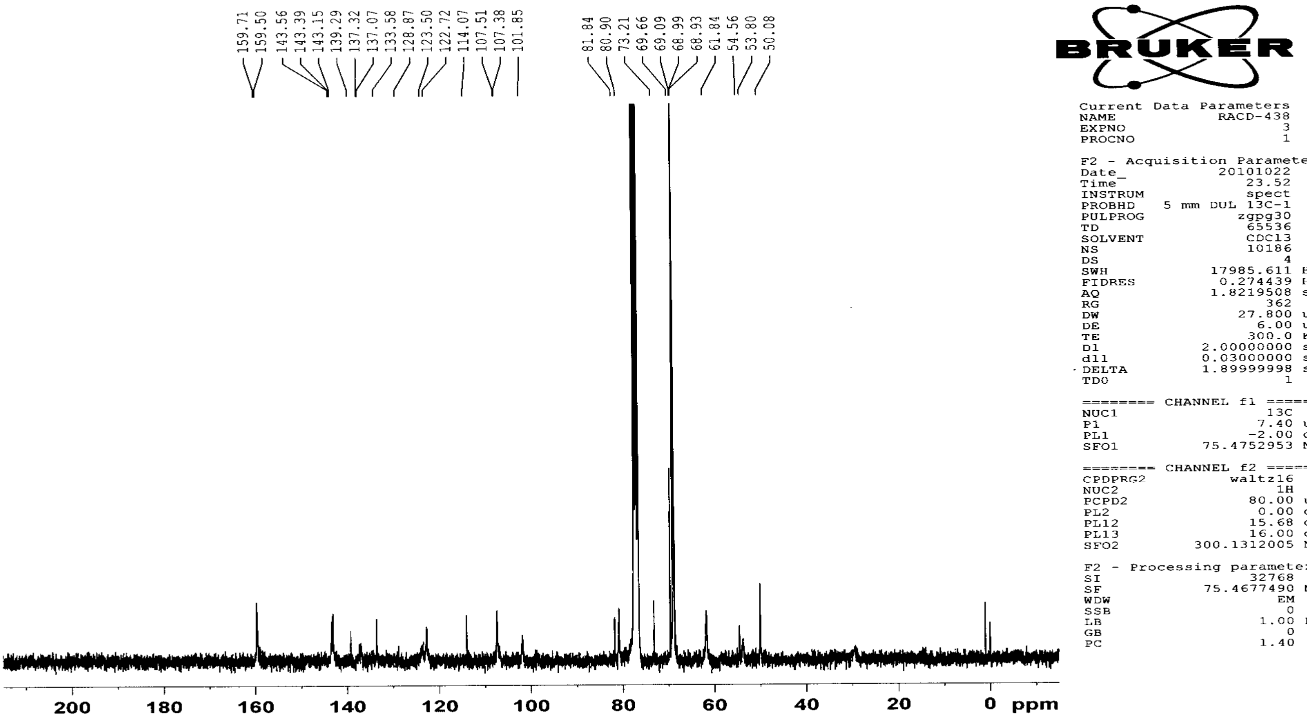
```
Current Data Parameter
NAME             RACD-429.
EXPNO
PROCNO

F2 - Acquisition Param
Date_              2010100
Time                  16.4
INSTRUM               spec
PROBHD     5 mm DUL 13C-
PULPROG              zgpg3
TD                    6553
SOLVENT               CDCl
NS                     845
DS
SWH               17985.61
FIDRES             0.27443
AQ                1.821950
RG                    574.
DW                   27.80
DE                     6.0
TE                    300.
D1               2.0000000
d11              0.0300000
DELTA            1.8999999
TD0

======== CHANNEL f1 ==
NUC1                    13
P1                     7.4
PL1                   -2.0
SFO1             75.475295

======== CHANNEL f2 ==
CPDPRG2             waltz1
NUC2                     1
PCPD2                 80.0
PL2                    0.0
PL12                  15.6
PL13                  16.0
SFO2            300.131200

F2 - Processing parame
SI                    3276
SF               75.467749
WDW                      E
SSB
LB                     1.0
GB
PC                     1.4
```

^{13}C NMR spectrum (75 MHz, CDCl$_3$) of ferrocenyldendrimer 2



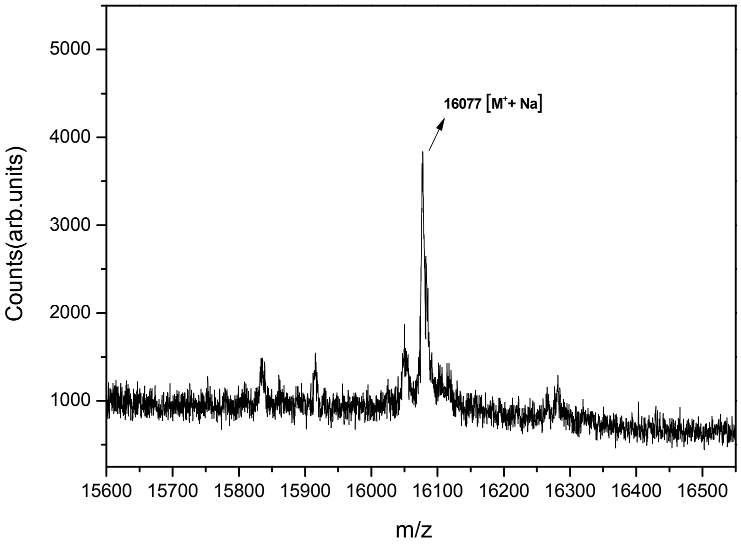
```
Current Data Parameters
NAME             RACD-438
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_            20101018
Time                16.19
INSTRUM             spect
PROBHD   5 mm DUL 13C-1
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              6172.839 Hz
FIDRES           0.094190 Hz
AQ              5.3084660 sec
RG                    128
DW                 81.000 usec
DE                   6.00 usec
TE                  300.0 K
D1             1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  13.15 usec
PL1                  0.00 dB
SFO1          300.1318534 MHz

F2 - Processing parameters
SI                  32768
SF            300.1300044 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

^{1}H NMR spectrum (300 MHz, CDCl$_3$) of ferrocenyldendrimer 3



```
Current Data Parameters
NAME              RACD-438
EXPNO                    3
PROCNO                   1

F2 - Acquisition Paramete
Date_             20101022
Time                 23.52
INSTRUM              spect
PROBHD    5 mm DUL 13C-1
PULPROG            zgpg30
TD                   65536
SOLVENT              CDCl3
NS                   10186
DS                       4
SWH              17985.611
FIDRES            0.274439
AQ               1.8219508
RG                     362
DW                  27.800
DE                    6.00
TE                   300.0
D1              2.00000000
d11             0.03000000
DELTA           1.89999998
TD0                      1

======== CHANNEL f1 =====
NUC1                   13C
P1                    7.40
PL1                  -2.00
SFO1            75.4752953

======== CHANNEL f2 =====
CPDPRG2            waltz16
NUC2                    1H
PCPD2                80.00
PL2                   0.00
PL12                 15.68
PL13                 16.00
SFO2           300.1312005

F2 - Processing paramete
SI                   32768
SF              75.4677490
WDW                     EM
SSB                      0
LB                    1.00
GB                       0
PC                    1.40
```

^{13}C NMR spectrum (75 MHz, $CDCl_3$) of ferrocenyldendrimer 3



Mass (MALDI-TOF) spectrum of ferrocenyldendrimer 3