Supporting Information

Synthesis, Characterization and Biological Properties of New Hybrid Carbosilane-Viologen-Phosphorus Dendrimers

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Synthesis of dendrimer $\{N_3P_3[(Viologen)G_1CBS(NH_3)_2]_6\}(Cl)_{24}$ (11). Dendrimer **9** (360 mg, 0.049 mmol) was desprotected with 5 mL of a solution of TFA al 20% in dichlorometane anhydrous, the mixture was stirred for 30 min. The solvent was removed in vacuum. After the crude was dissolved in acetonitrile (20 mL) and 3 mL of a saturated aqueous solution of $^tBu_4NCl$ added carefully. The resulting solid was filtered and washed many times with acetonitrile, obtaining the compound **11** as yellow solid (200 mg, 78%).

^1H NMR (300 MHz, CD_3OD): δ 0.03 (s, 90H, Si*Me* and SiMe_2), 0.60 (m 84H, SiCH_2CH$_2$CH$_2$NH and SiCH_2), 1.41 (m, 36H, CH_2), 1.66 (m, 24H, CH_2), 2.11 (m, 12H, N^+CH$_2$CH_2), 2.90 (m, 24H, CH_2NH), 3.31 (s,18H, CH_3 overlapped with methanol), 4, 74 (t, 12H, N^+CH_2)5.93 (s, 12H, CH$_2$), 7.51 (m, 12H, H^3), 7.78 (m, 18H, H^2 and C*H*=N), 8.65 (m, 24H, H^6 and H^9), 9.27 (m, 24H, H^5 and H^{10}). ^{13}C {^1H} NMR (75 MHz, CD_3OD): δ -5.05 (Si*Me*), -3.44 (SiMe_2), 13.04-24.79 (Si*C*H$_2$), 36.70 (N^+CH$_2$*C*H$_2$), 43.74 (*C*H$_2$NH), 59.50 (N^+*C*H$_2$), 63.00 (CH$_2$), 128.57, 147.12 (aromatics, rest of signals not observed). ^{31}P NMR (300 MHz, CD_3OD): δ 18.12 (N_3P_3). Anal.Calcd for: $C_{240}Cl_{24}H_{426}N_{39}P_3Si_{18}$ (5307,54 g/mol): C, 54.31; H, 8.09; N, 10.29. Found: C, 53.78; H, 8.17 N, 10.15.

Synthesis of dendrimer $\{N_3P_3[(Viologen)G_2CBS(NH_3)_4]_6\}(Cl)_{36}$ (12). The deprotection of dendrimer **10** (0.350, 0.030 mmol) with TFA (5 mL) was carried out in the similar way than the synthesis of **11**. The compound **12** was obtained as yellow solid (0.210 mg, 80 %).

^1H NMR (300 MHz, CD_3OD): δ 0.03 (s, 198H, Si*Me* and SiMe_2), 0.60 (m, 196H, SiCH_2CH$_2$CH$_2$NH and SiCH$_2$), 1.40 (m, 92H, CH_2), 1.66 (m, 48H, CH_2), 2.07 (m, 12H, N^+CH$_2$CH_2), 2.90 (m, 48H, CH_2NH), 3.31 (s,18H, CH_3 overlapped with methanol), 4.74 (12H, N^+CH_2), 5.93 (s, 12H, CH$_2$), 7.50 (m, 12H, H^3), 7.78 (m, 18H, H^2 and C*H*=N), 8.65 (m, 24H, H^6 and H^9), 9.27 (m, 24H, H^5 and H^{10}). ^{13}C {^1H} NMR (75 MHz, CD_3OD): δ -5.71 (Si*Me*), -4.70 (SiMe_2), 11.68 (Si*C*H$_2$CH$_2$CH$_2$NH), 12.63-21.91

(Si*C*H_2), 36.21 (N^+CH_2*C*H_2), 42.34 (*C*H_2NH), 62.58 (N^+*C*H_2), 64.47 (CH_2), 128.51, 147.02 (aromatics, rest of signals not observed). ^{31}P NMR (300 MHz, CD_3OD): δ 16.42 (N_3*P*$_3$). Anal.Calcd for: $C_{384}H_{785}Cl_{36}N_{51}P_3Si_{42}$ (8666,50 g/mol): C, 53.22; H, 9.13; N, 8.24. Found: C, 52.93; H, 9.42; N, 7.94.

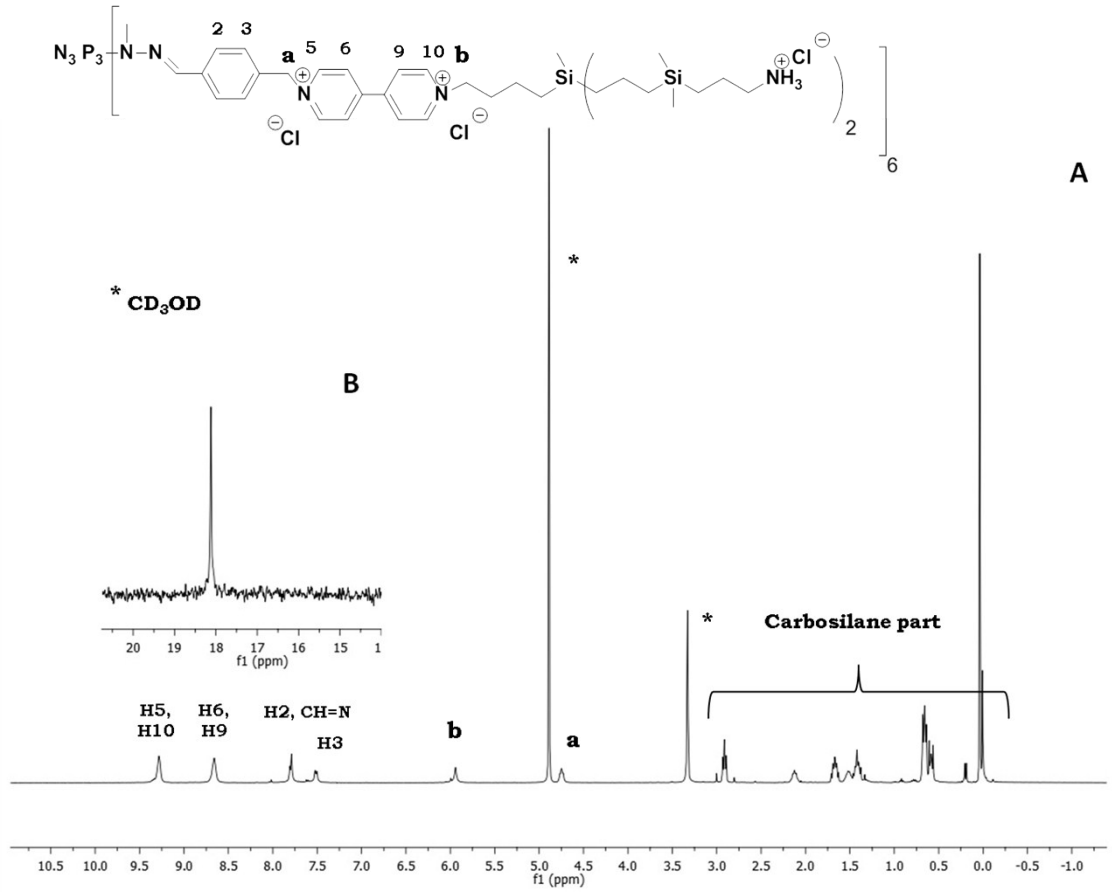

Figure S1. ^{1}H(**A**) and ^{31}P(**B**) NMR spectra of dendrimer **11** in d6-methanol.

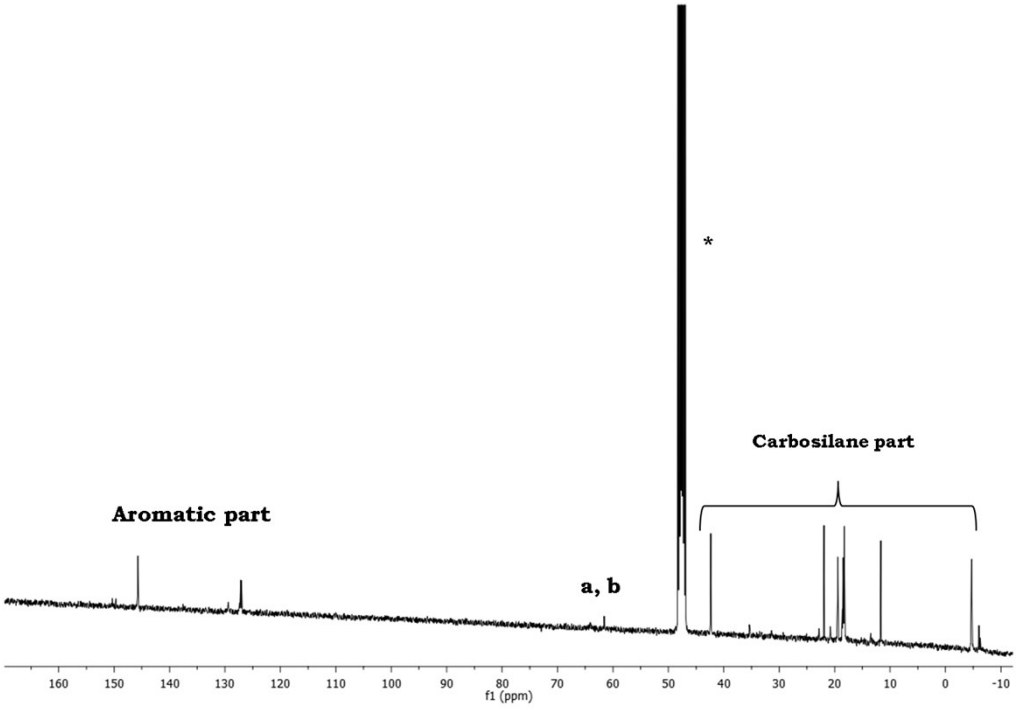

Figure S2. ^{13}C NMR spectrum of dendrimer **11** in d6-methanol.

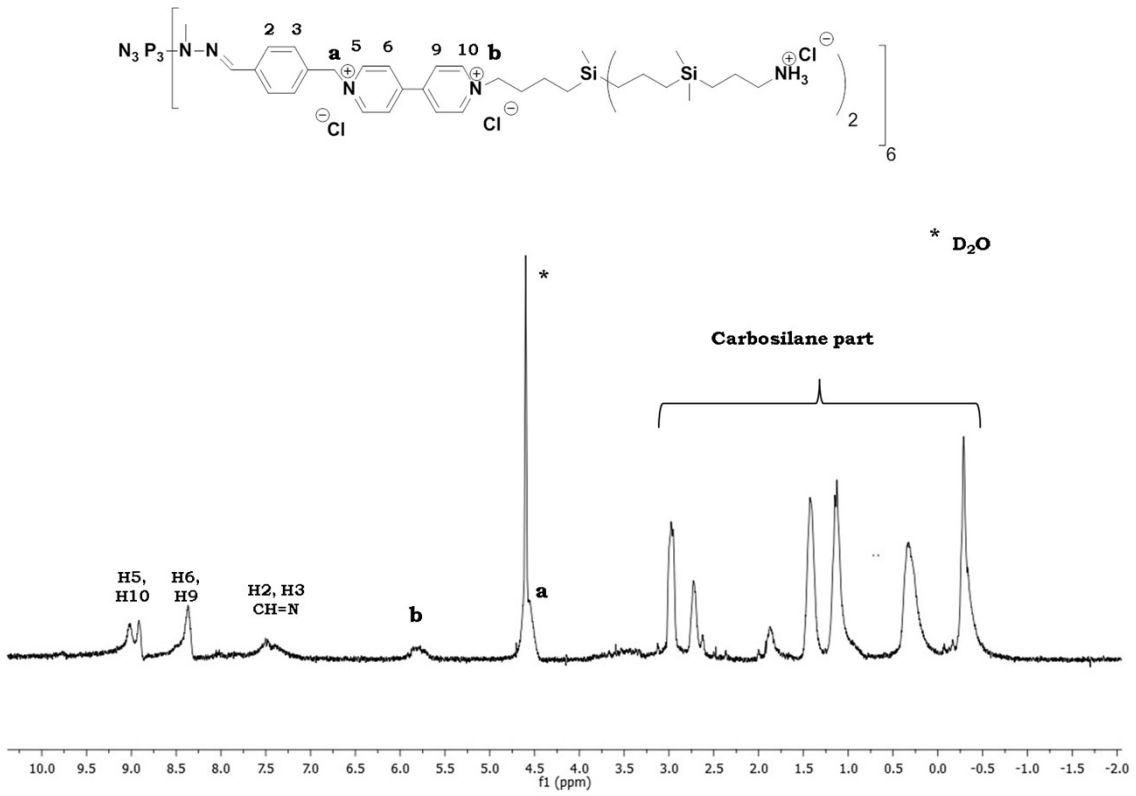

Figure S3. ^{1}H NMR spectrum of dendrimer **11** in D_2O.

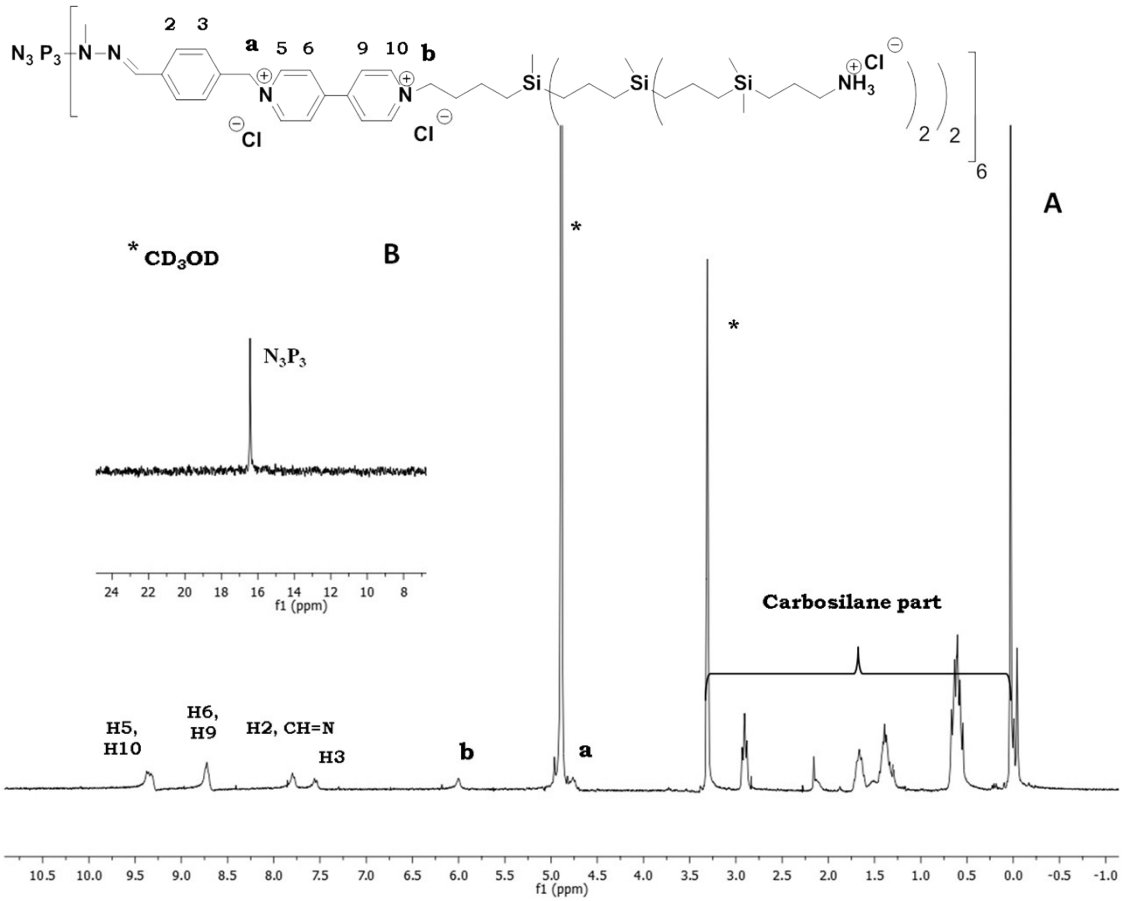

Figure S4. ^{1}H(**A**) and ^{31}P(**B**) NMR spectra of dendrimer **12** in d6-methanol.

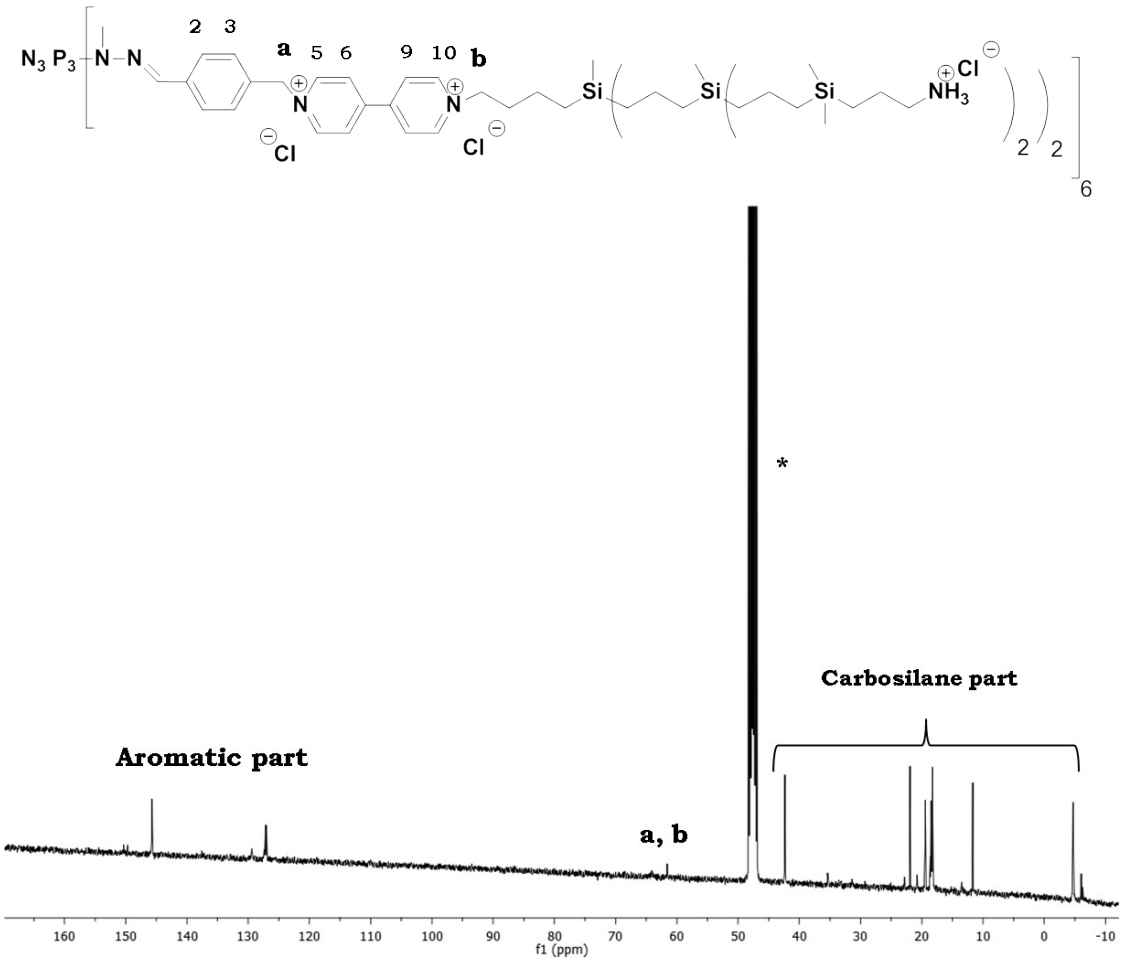

Figure S5. ^{13}C NMR spectrum of dendrimer **12** in d6-methanol.

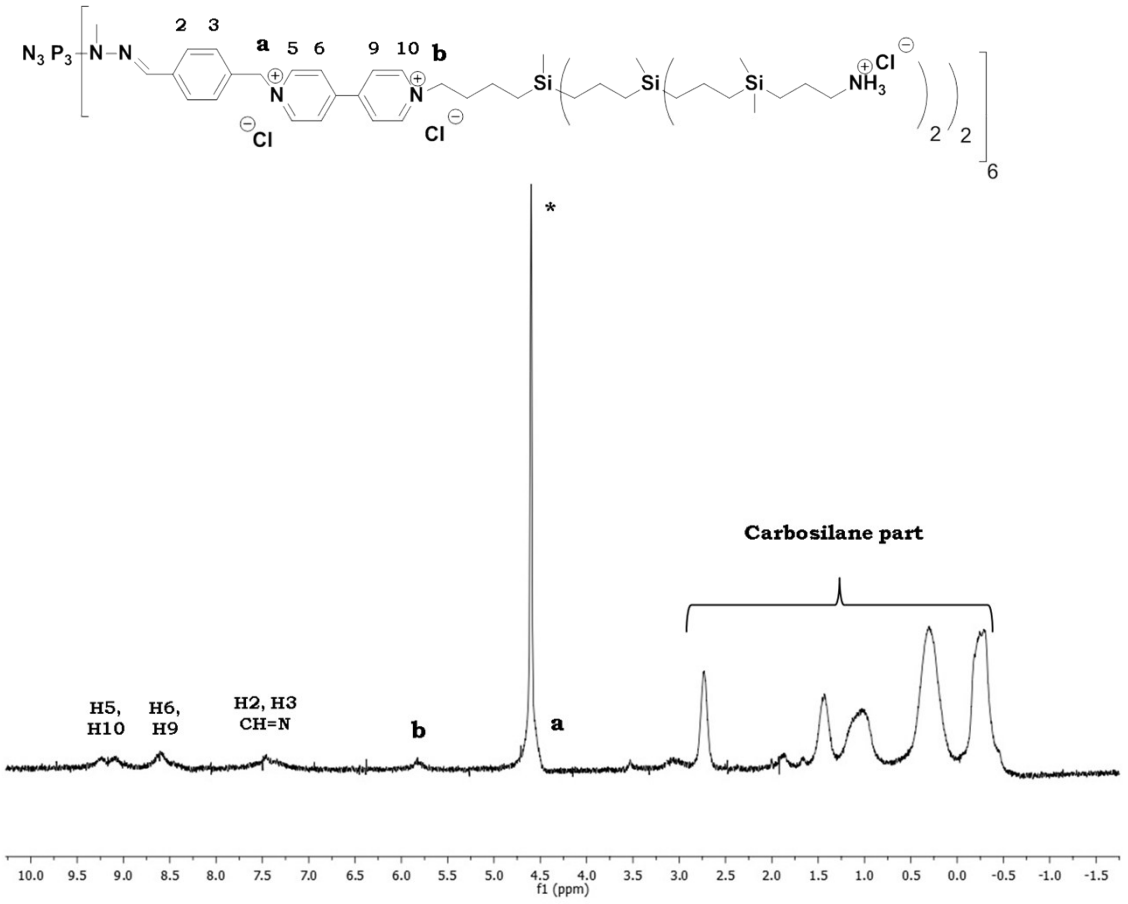

Figure S6. ^{1}H NMR spectrum of dendrimer **12** in D_2O.

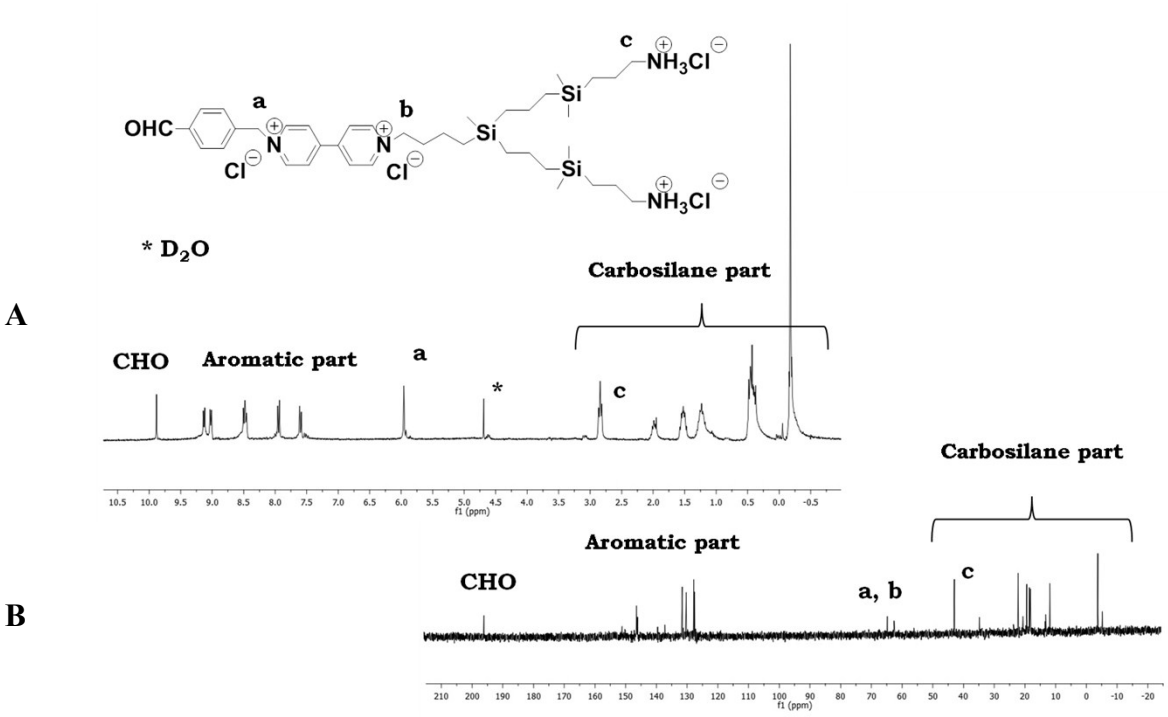

Figure S7. ^{1}H(**A**) and ^{13}C(**B**) NMR spectra of dendron **5** in D_2O

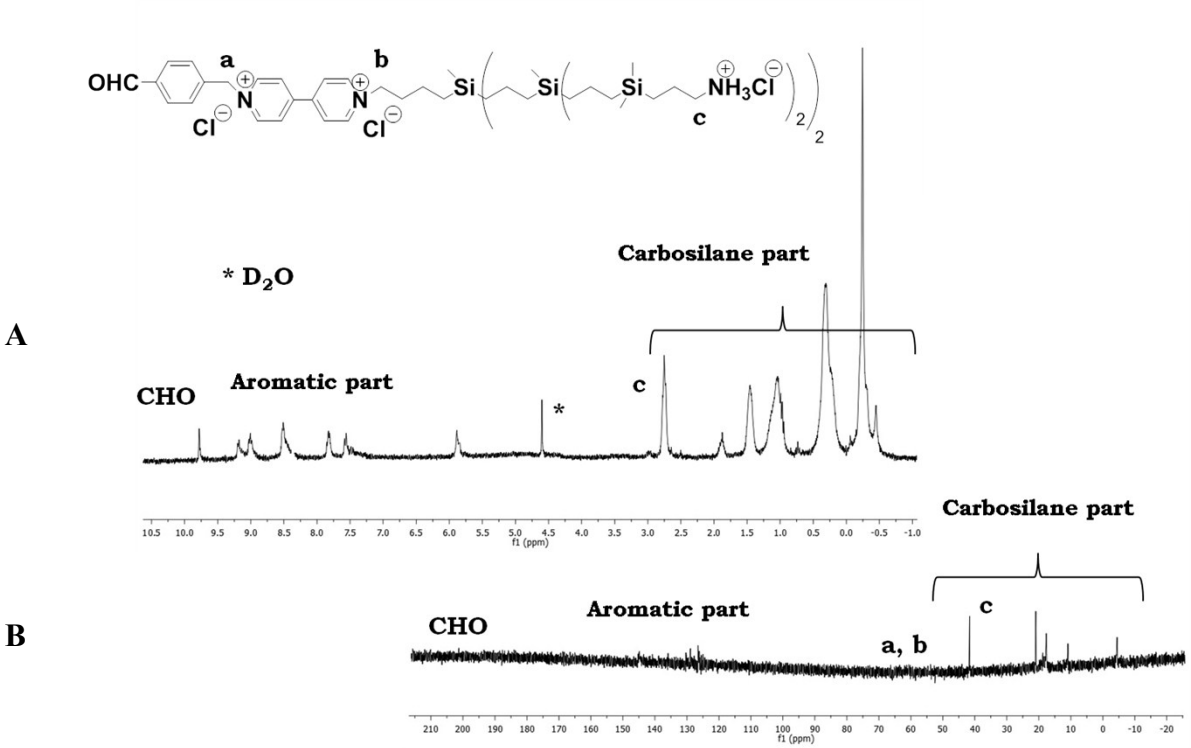

Figure S8. ^{1}H(**A**) and ^{13}C(**B**) NMR spectra of dendron **6** in D_2O