

Supplementary Figures

Spectra Data of Borenium and Borinium Compounds

Borenium 1: ^1H NMR (600 MHz, CDCl_3): δ 8.05 (d, $J=5.5$ Hz, 2H; CH aromatic pyridin), 6.74 (d, $J=5.3$ Hz, 2H; CH aromatic pyridin), 4.86 (m, 2H; CH connect to bor), 3.09 (s, 3H; CH_3 connect to nitrogen), 3.05 (s, 3H; CH_3 connect to nitrogen), 1.90-1.53 (m, 20H; CH_2 aliphatic). ^{13}C NMR (150 MHz, CDCl_3): 178.5, 155.8, 144.4, 142.1, 129.1, 128.4, 126.5, 106.5, 106.3, 69.4, 38.1, 34.8, 27.7, 27.2. IR (cm): 3341 (C-H aromatic), 2932 (C-H aliphatic), 2856 (C-H aliphatic), 1654 (C=O), 1402 (C=C aromatic), 1025 (C-C aliphatic).

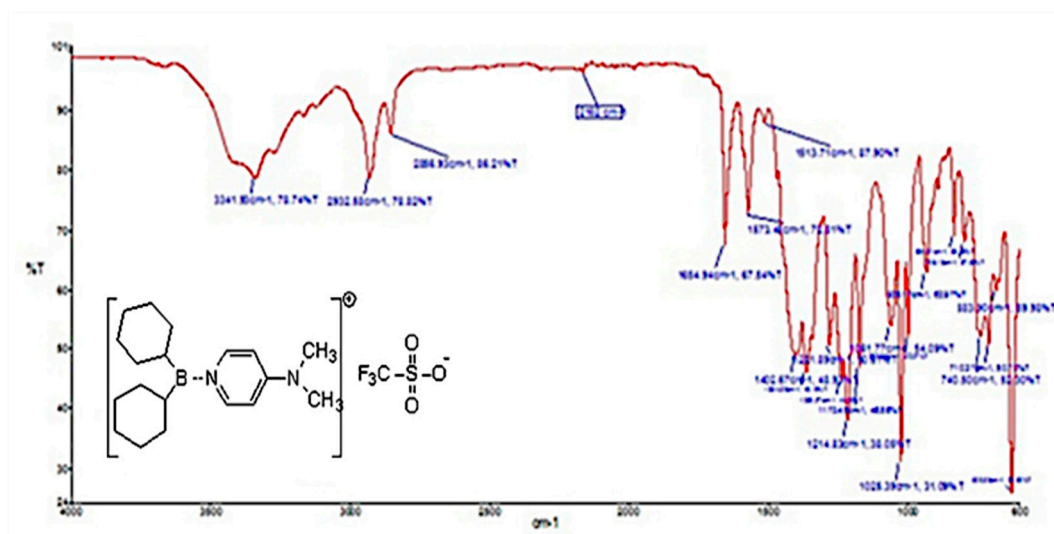


Figure S1. IR spectrum of dicyclohexyl borenium dimethyl amino pyridine trifluoro methane sulphonate (Borenium 1)

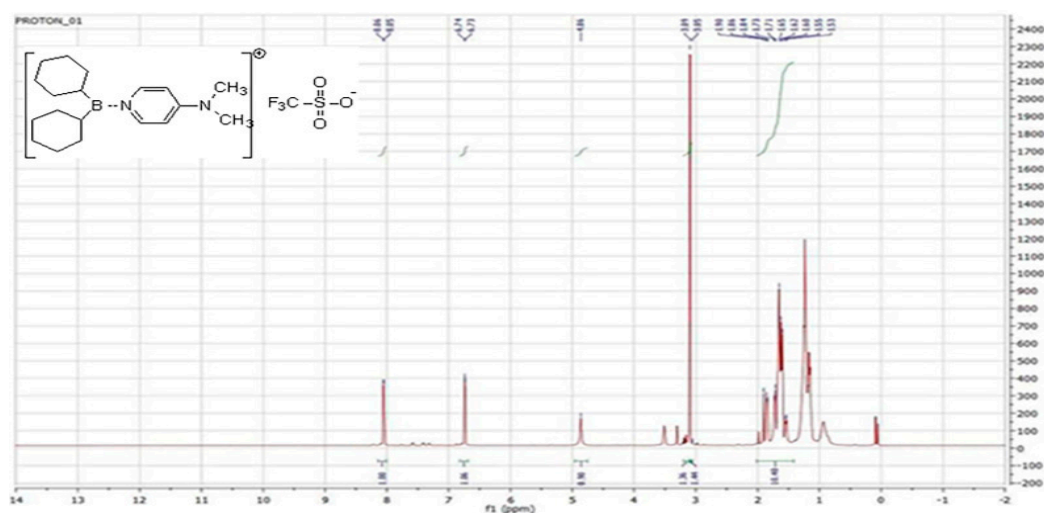


Figure S2. ¹H-NMR spectrum of dicyclohexyl borenium dimethyl amino pyridine trifluoro methane sulphonate (Borenium 1)

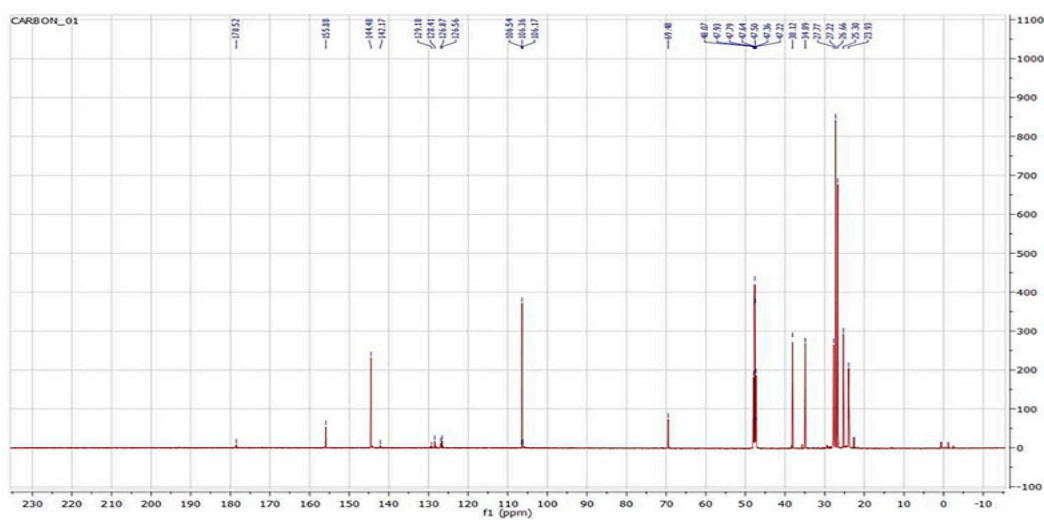


Figure S3. ¹³C-NMR spectrum of dicyclohexyl borenium dimethyl amino pyridine trifluoro methane sulphonate (Borenium 1)

Borenium 2: ^1H NMR (600 MHz, CDCl_3): δ 8.18 (d, $J=6.5$ Hz, 2H; CH aromatic pirydin), 6.71 (d, $J=6.4$ Hz, 2H; CH aromatic pirydin), 3.98 (s, 1H; CH aliphatic), 3.22 (s, 6H; CH_3 connect to nitrogen), 3.02 (d, $J=7.5$ Hz, 2H; CH_2 aliphatic), 1.68 (m, 1H; CH aliphatic), 1.55-0.94 (m, 20H; CH_2 aliphatic), 0.93 (d, $J=5.5$ Hz, 6H; CH_3 aliphatic), ^{13}C NMR (150 MHz, CDCl_3): 175.5, 155.6, 154.9, 144.0, 129.6, 128.5, 126.3, 106.6, 77.2, 77.0, 53.8, 39.7, 24.8, 23.0. IR(cm): 3313 ($-\text{NH}_2$), 3197 (C-H aromatic), 2915 (C-H aliphatic), 2841 (C-H aliphatic), 1697 (C=O), 1370 (C=C aromatic), 1232 (C-C aliphatic), 1055 (C-O).

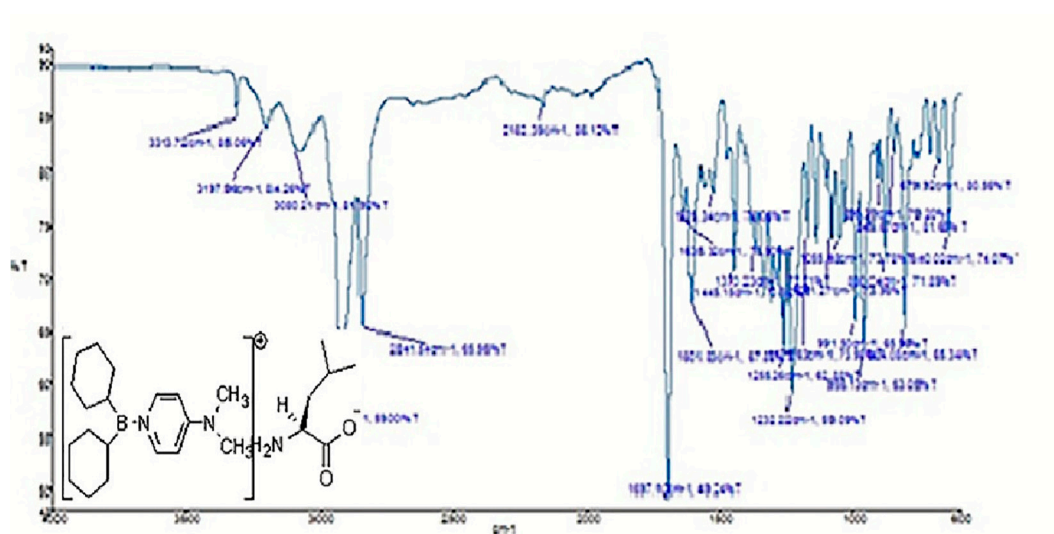


Figure S4. IR spectrum of dicyclohexyl borenium dimethyl amino pyridine 2-amino-4-methylpentanoate (Borenium 2)

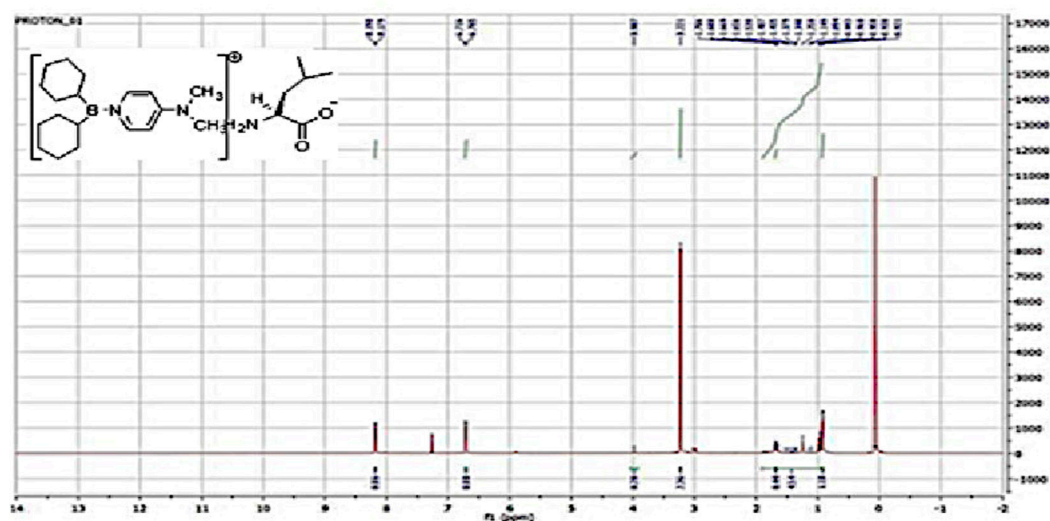


Figure S5. ¹H-NMR spectrum of dicyclohexyl borenium dimethyl amino pyridine 2-amino-4-methylpentanoate (Borenium 2)

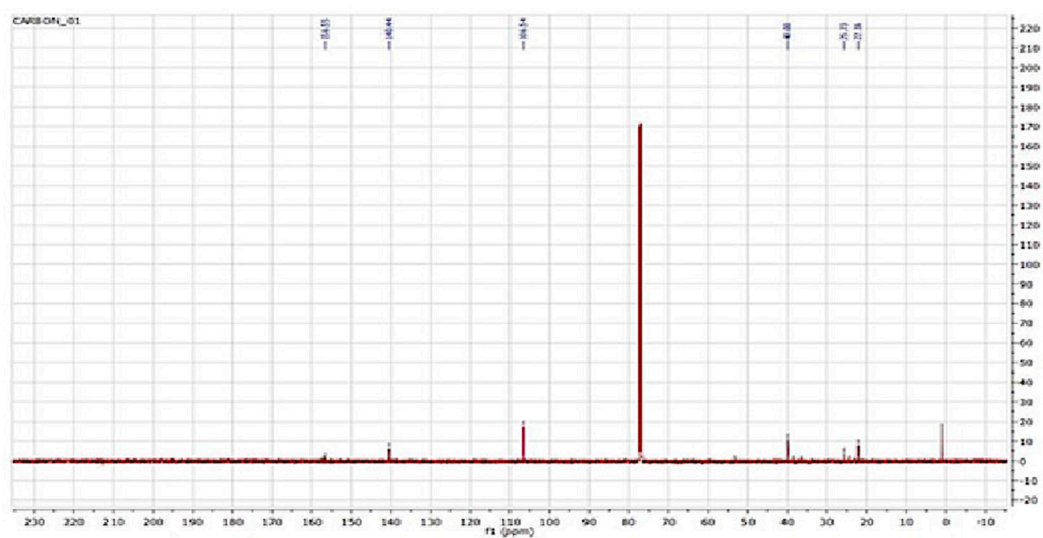


Figure S6. ¹³C-NMR spectrum of dicyclohexyl borenium dimethyl amino pyridine 2-amino-4-methylpentanoate (Borenium 2)

Borenium 3: ^1H NMR (600 MHz, CD_3OD): δ 8.09 (d, $J=6.9$ Hz, 2H; CH aromatic pyridin), 6.90 (d, $J=6.7$ Hz, 2H; CH aromatic pyridin), 3.21 (s, 3H; CH_3 connect to nitrogen), 3.19 (s, 3H; CH_3 connect to nitrogen), 2.70 (s, 3H; CH_3 connect to nitrogen), 2.68 (s, 3H; CH_3 connect to nitrogen), 2.67 (s, 3H; CH_3 connect to nitrogen). ^{13}C NMR (150 MHz, CD_3OD): 161.7, 157.0, 140.6, 119.6, 116.8, 115.4, 114.3, 106.6, 38.5, 33.9, 29.3, 24.0. IR(cm): 3067 (C-H aromatic), 2934 (C-H aliphatic), 1962 (C-H), 1641 (C=O), 1392 (C=C aromatic), 1207 (C-C aliphatic).

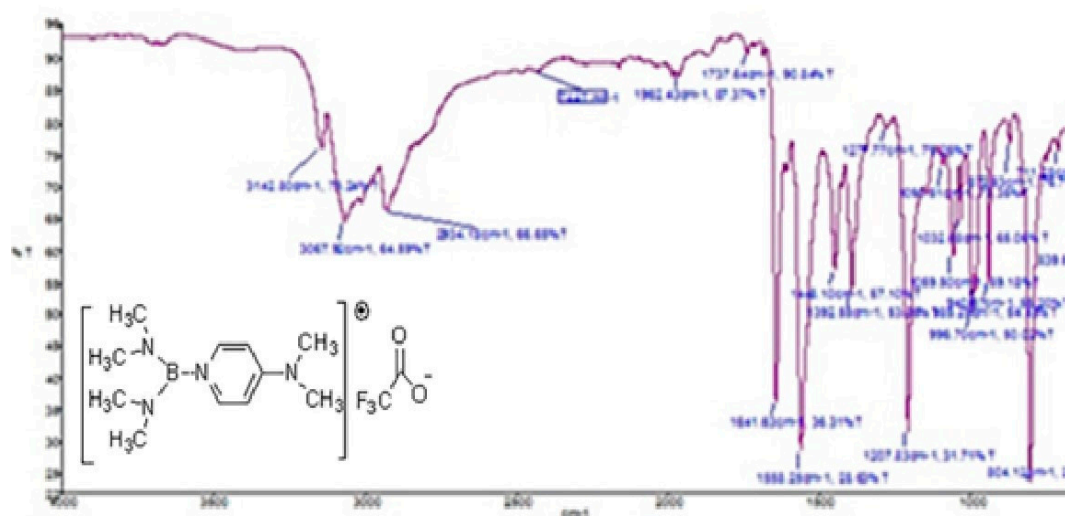
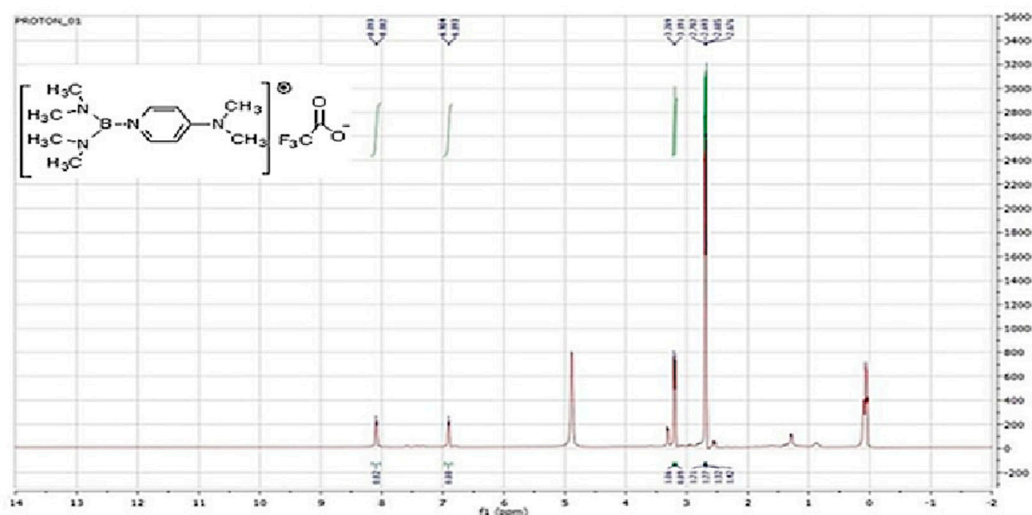


Figure S7. IR spectrum of bisdimethyl amino borenium dimethyl amino pyridine trifluoroacetate (Borenium 3)



Borinium 4: ^1H NMR (600 MHz, CD_3OD): δ 3.60 (m, 2H; CH connect to boron), 1.86-1.27 (m, 20H; CH_2 aliphatic). ^{13}C NMR (150 MHz, CD_3OD): 69.5, 56.9, 34.8, 34.1, 32.2, 25.2, 23.8. IR(cm): 2937 (C-H aliphatic), 2860 (C-H aliphatic), 1176 (-CH aliphatic).

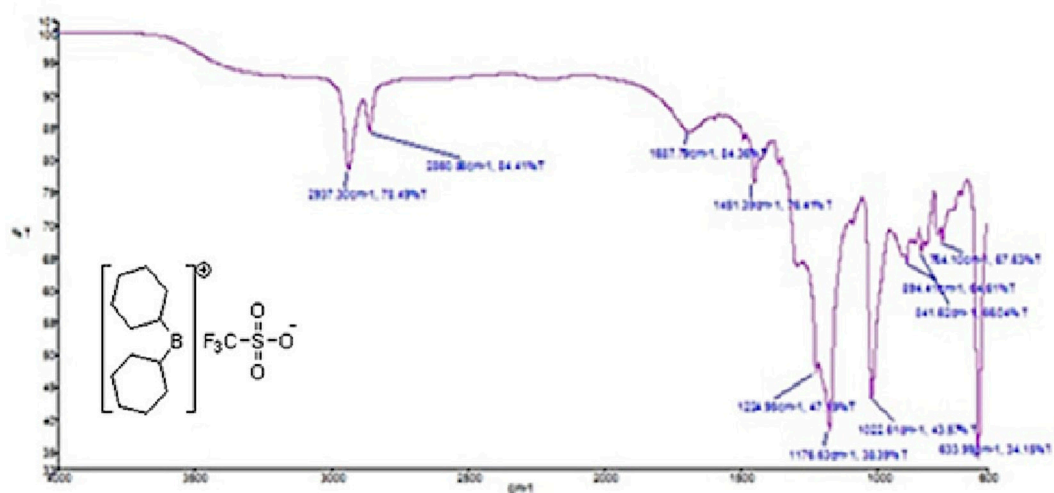


Figure S10. IR spectrum of dicyclohexyl borinium trifluoro methane sulphonate (Borinium 4)

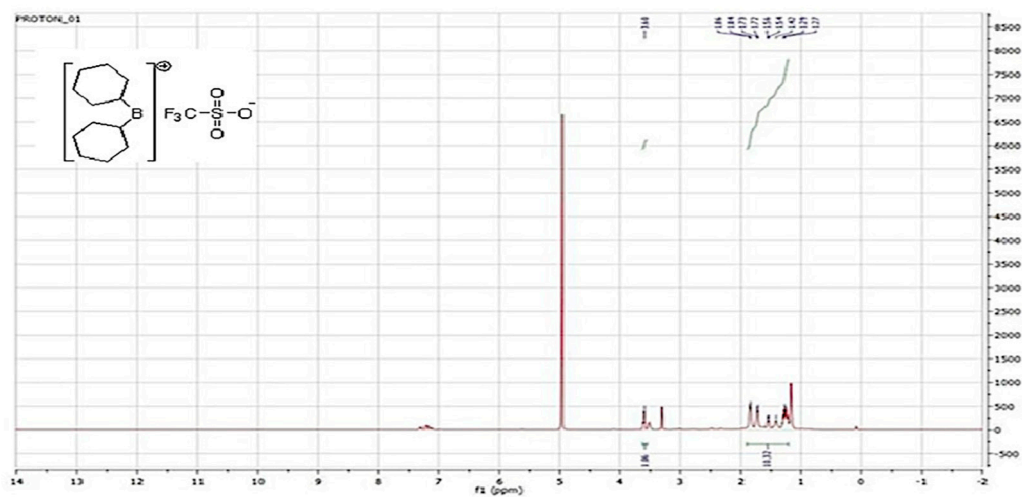


Figure S11. ¹H-NMR spectrum of dicyclohexyl borinium trifluoro methane sulphonate (Borinium 4)

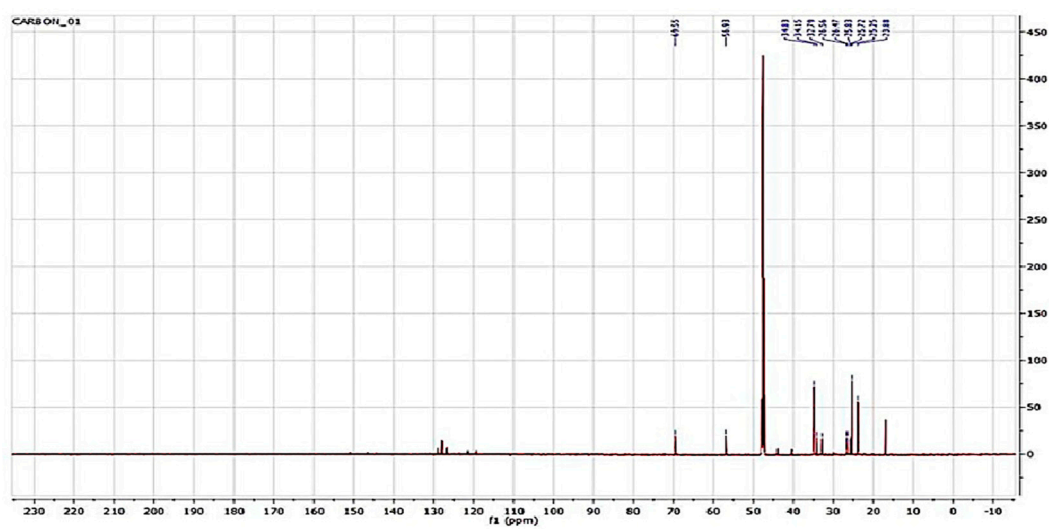


Figure S12. ¹³C-NMR spectrum of dicyclohexyl borinium trifluoro methane sulphonate (Borinium 4)

Borinium 5: ^1H NMR (600 MHz, CD_3OD): δ 7.28 (s, 2H; CH aromatic), 7.10 (s, 2H; CH aromatic), 4.9 (s, 2H; BH2), 2.53 (s, 6H; CH3). ^{13}C NMR (150 MHz, CD_3OD): δ 145.6, 125.0, 116.8, 10.6, 10.5. **IR (cm):** 3871, 3091, 3055, 2931, 2429, 2127, 1583, 1420.

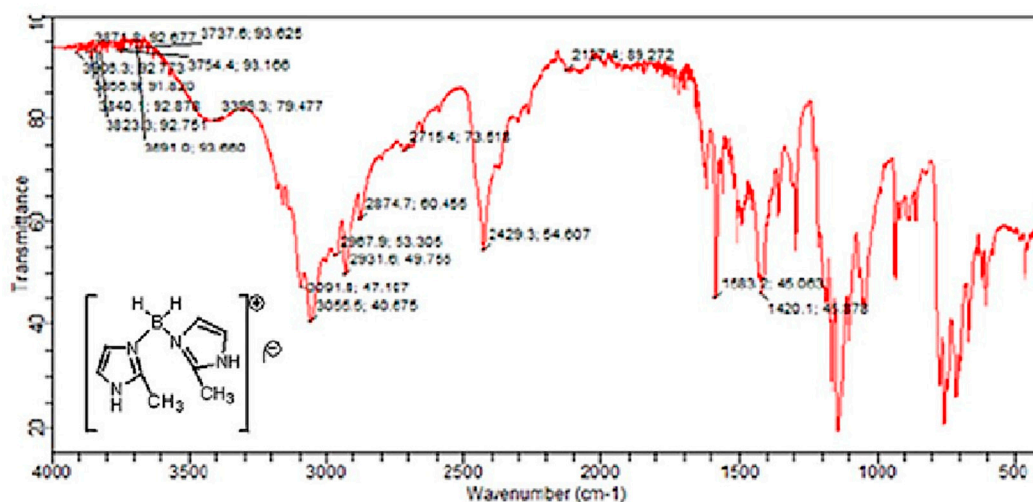


Figure S13. IR spectrum of Bis (2-methyl-1H-imidazol-3-yl) dihydroboronium iodide (Borinium 5)

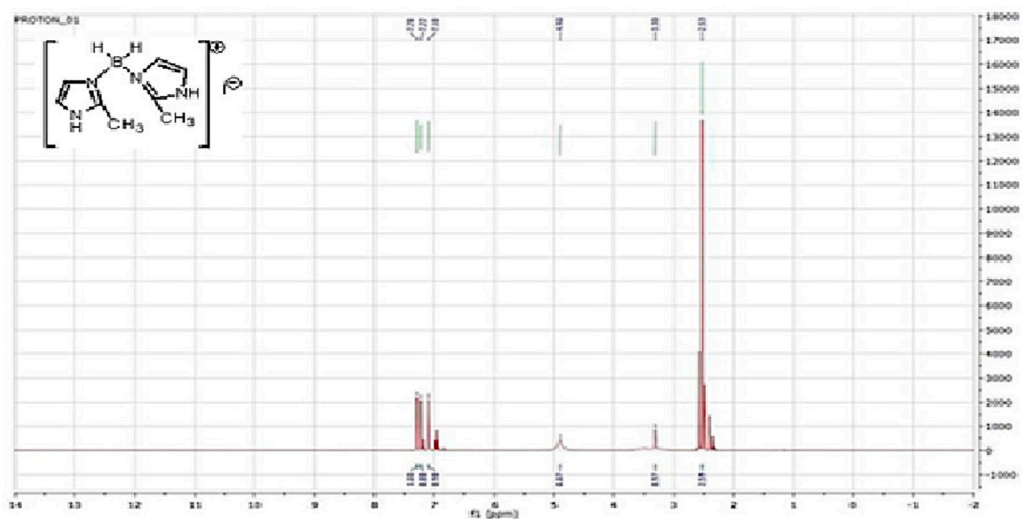


Figure S14. ^1H -NMR spectrum of Bis (2-methyl-1H-imidazol-3-yl) dihydroboronium iodide (Borinium 5)

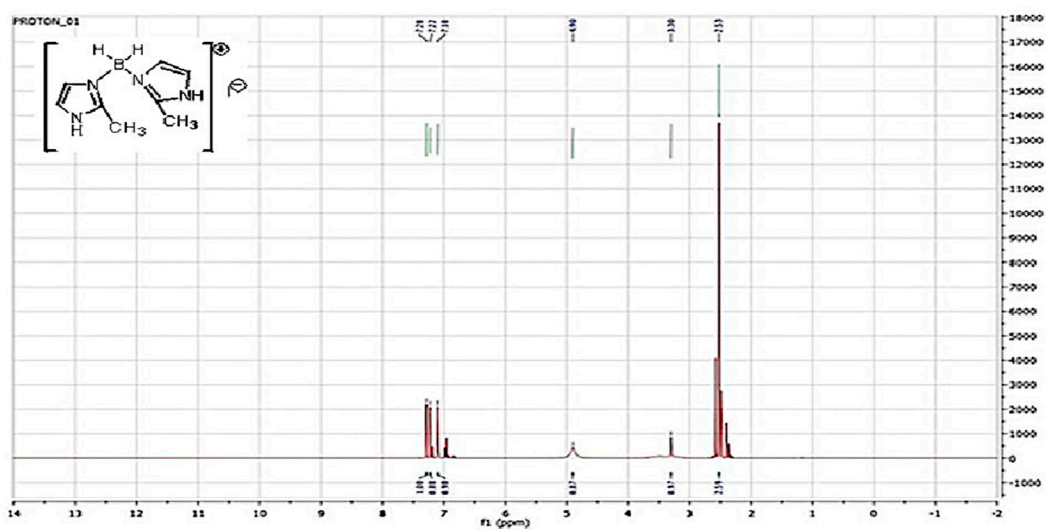


Figure S15. ^{13}C -NMR spectrum of bis(1,2-dimethyl-1H-imidazol-3-yl) dihydroboronium iodide (Borinium 5)

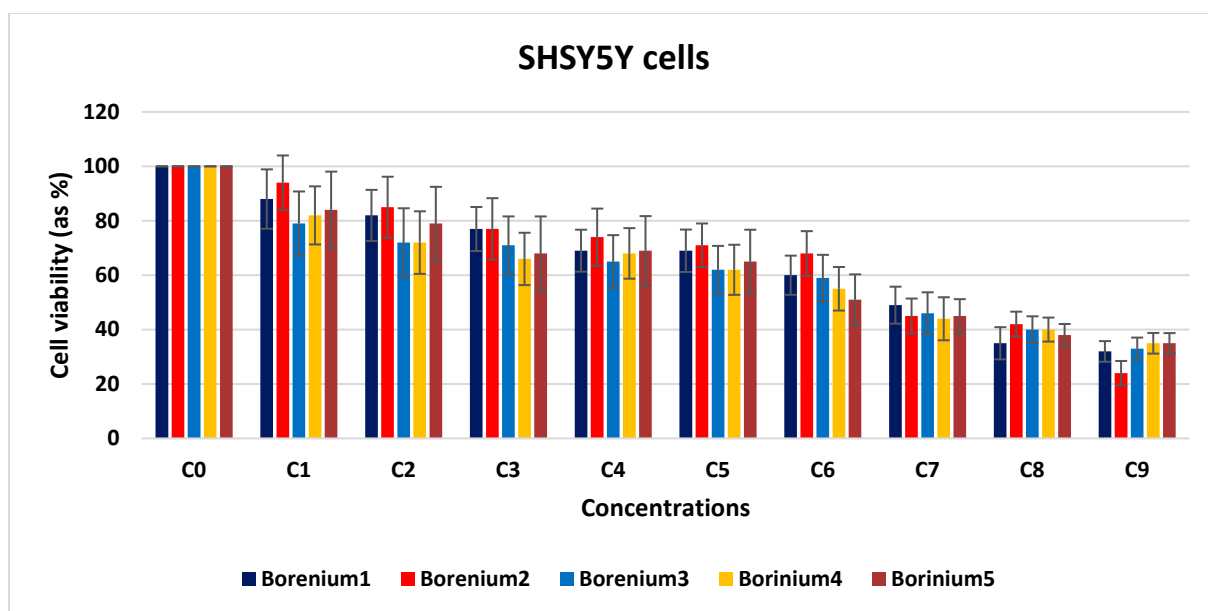


Fig S16. Cytotoxic activity of compounds in SHSY-5Y cells

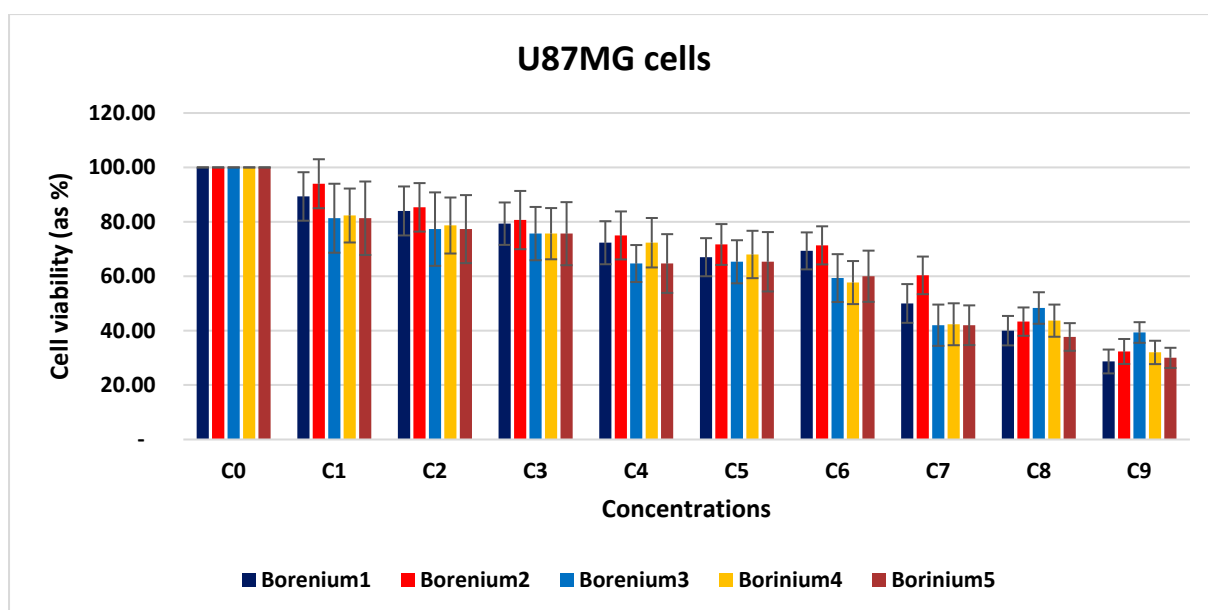


Fig S17. Cytotoxic activity of compounds in U87MG cells

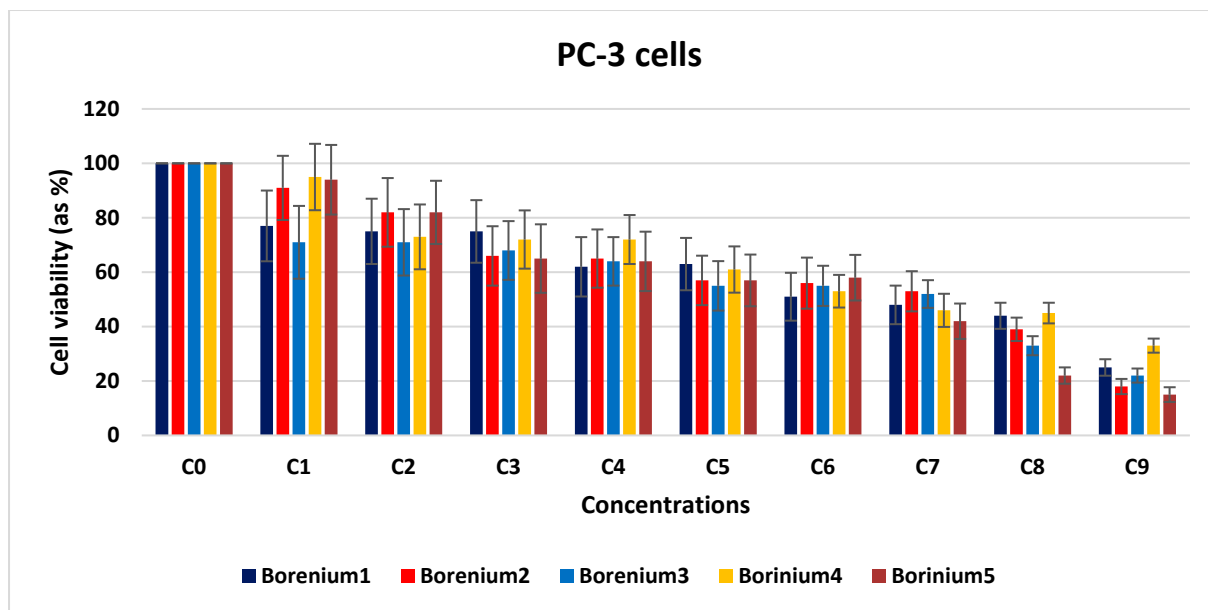


Fig S18. Cytotoxic activity of compounds in PC-3 cells

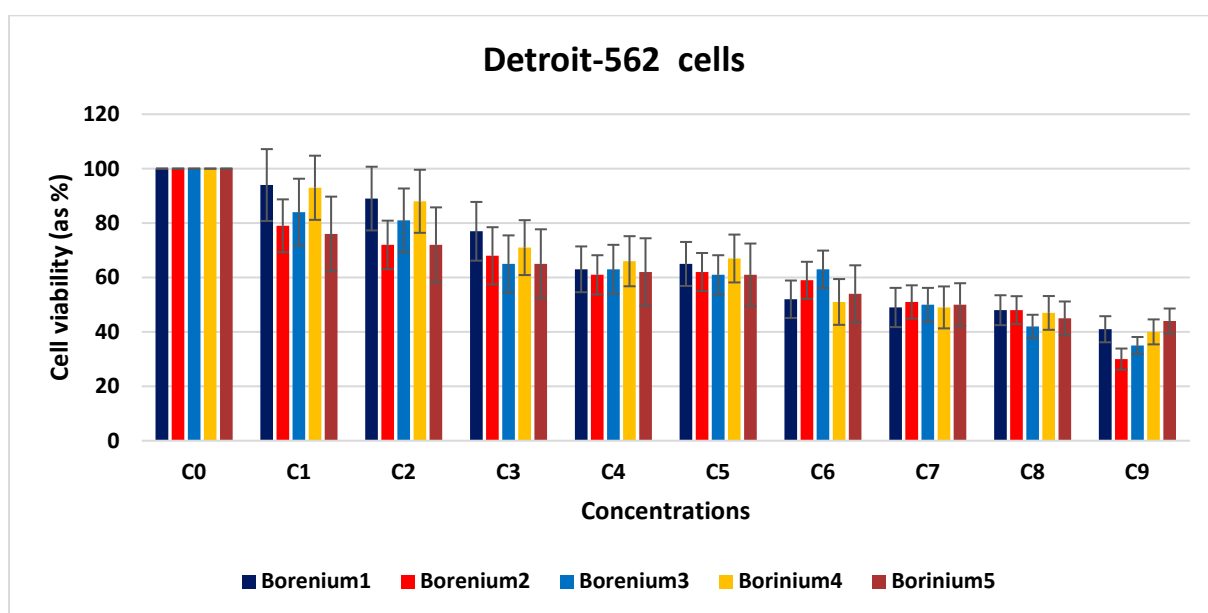


Fig S19. Cytotoxic activity of compounds in Detroit-562 cells

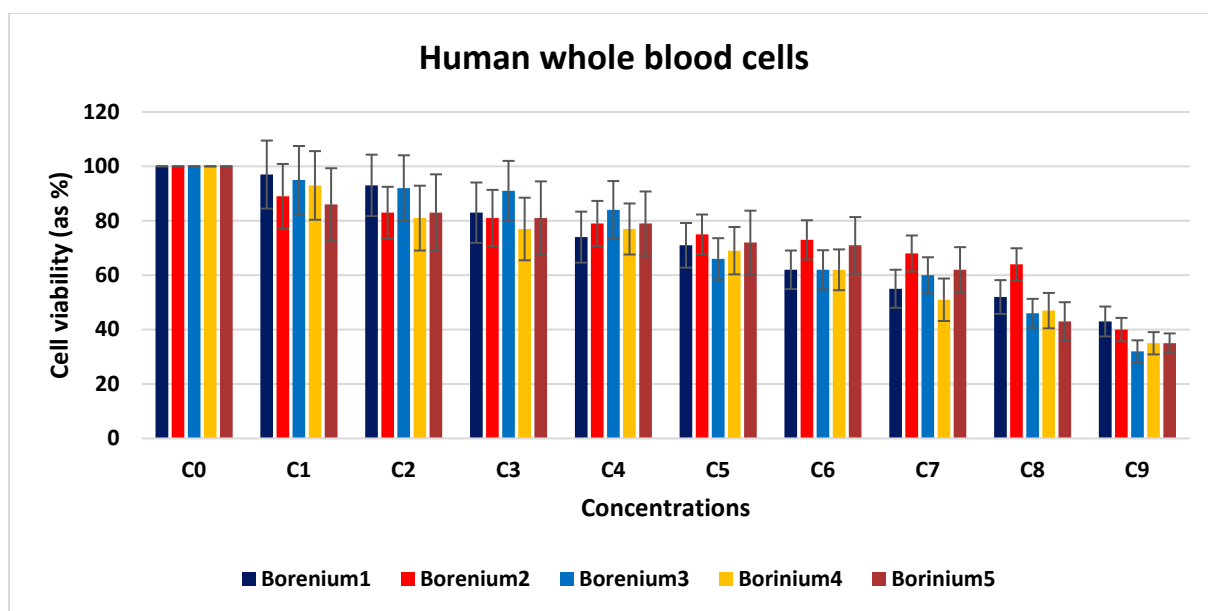


Fig S20. Cytotoxic activity of compounds in cultured human whole blood cells