

Trifluoromethoxy pyrazines: Preparation and Properties

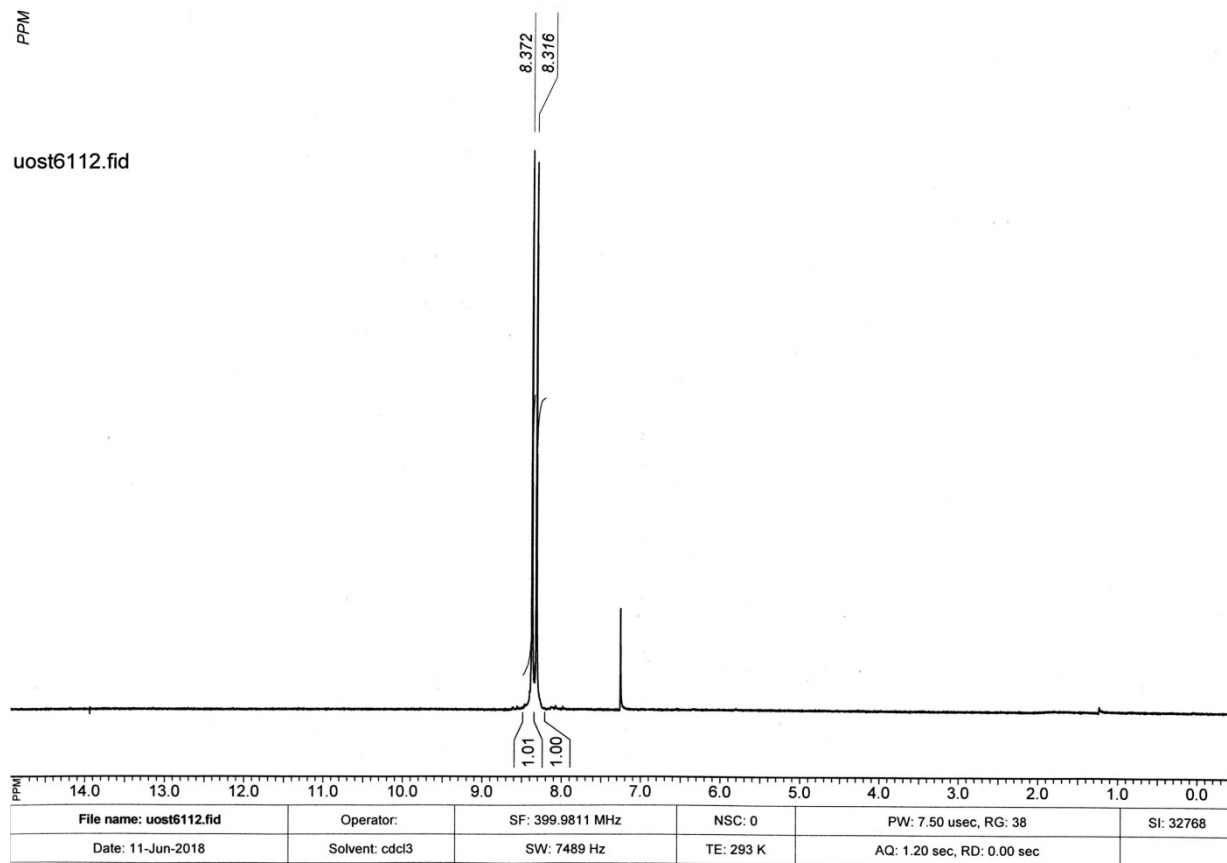
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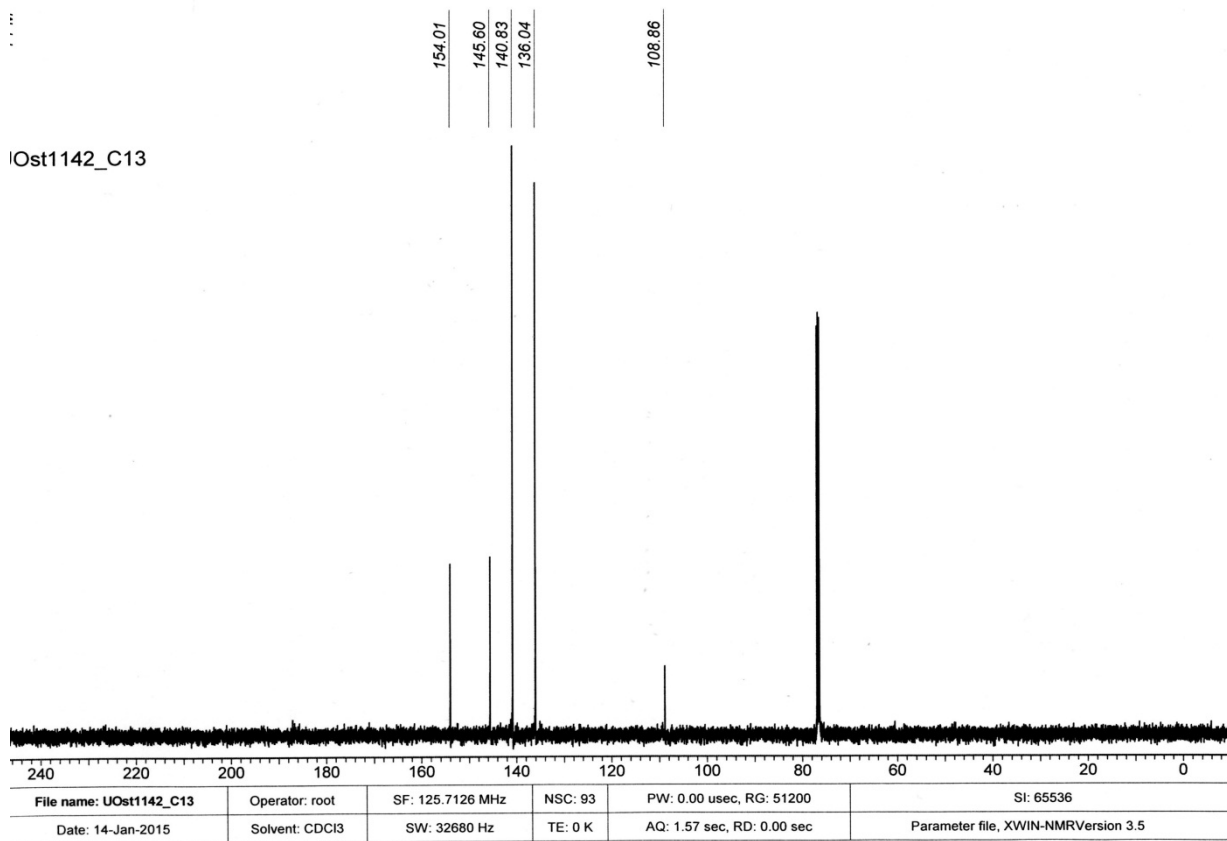
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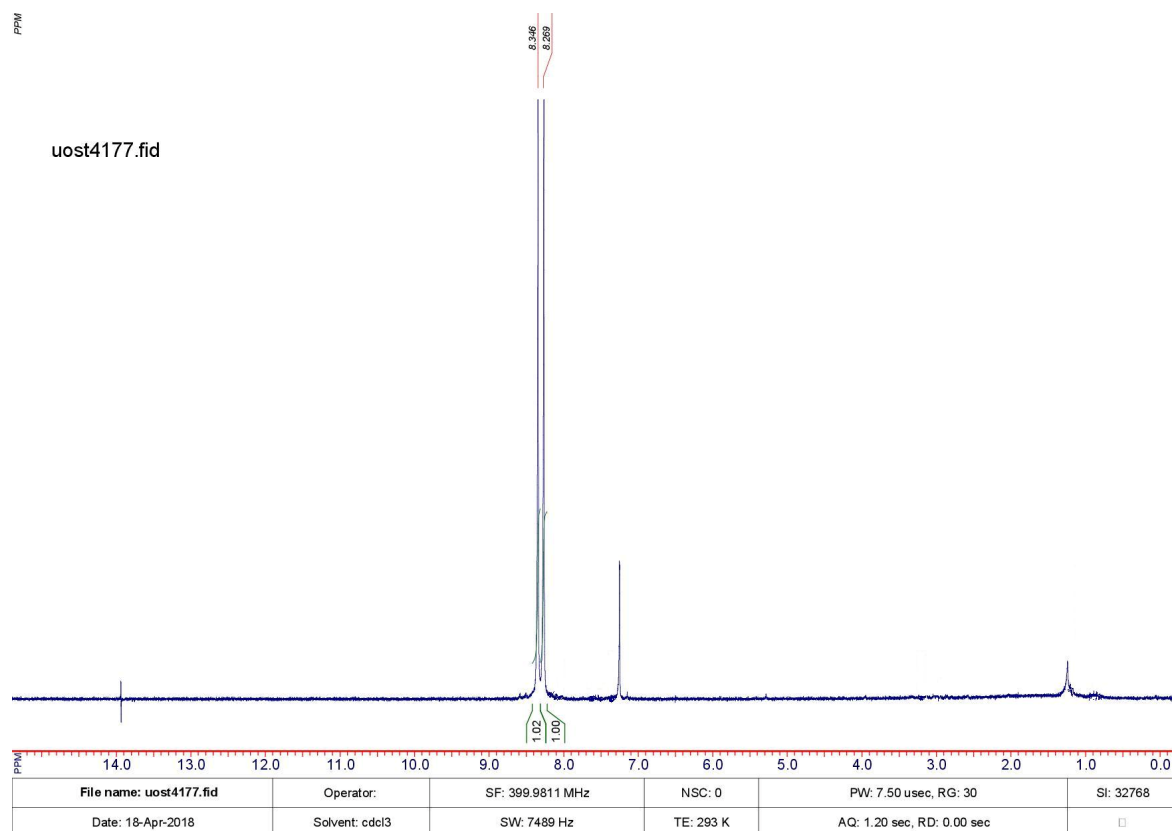
1.1. 2-Chloro-5-(trichloromethoxy)pyrazine 2 (¹H NMR).



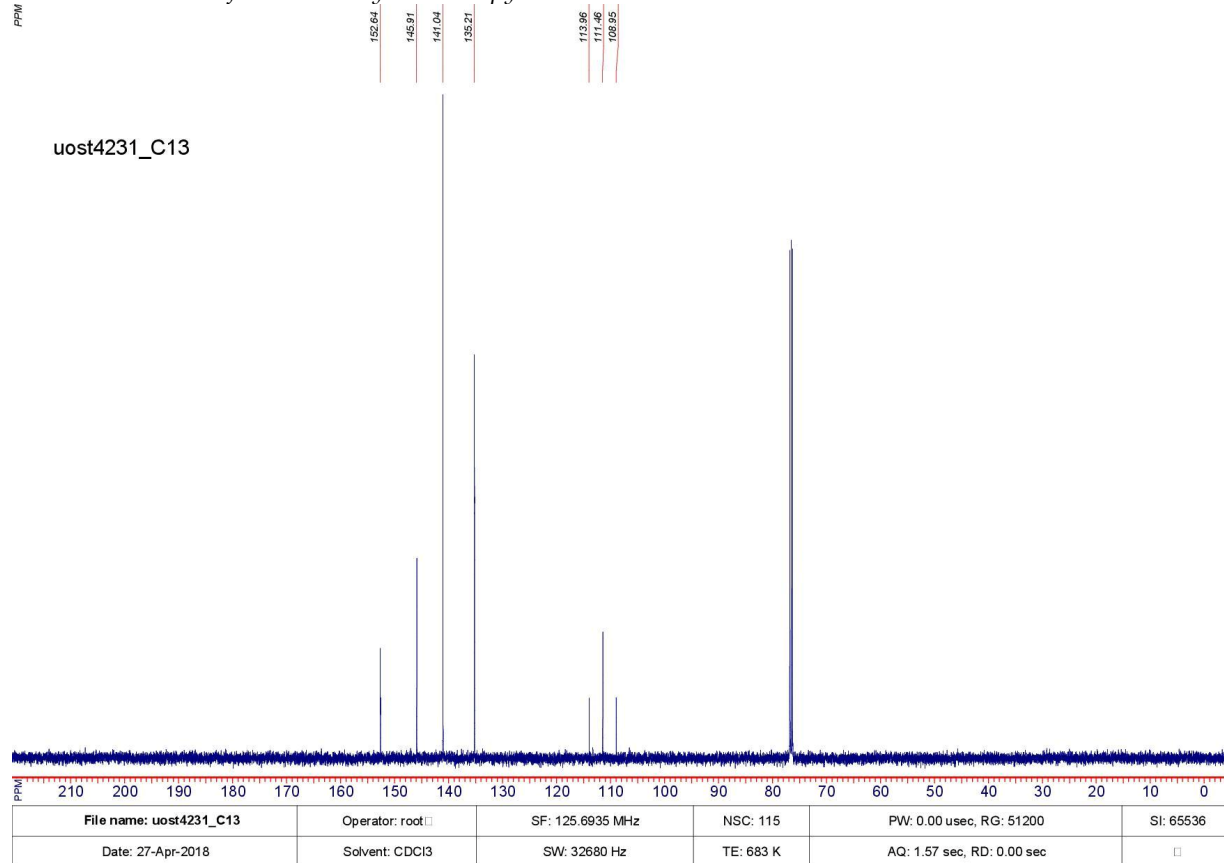
1.2. 2-Chloro-5-(trichloromethoxy)pyrazine 2 (¹³C NMR).



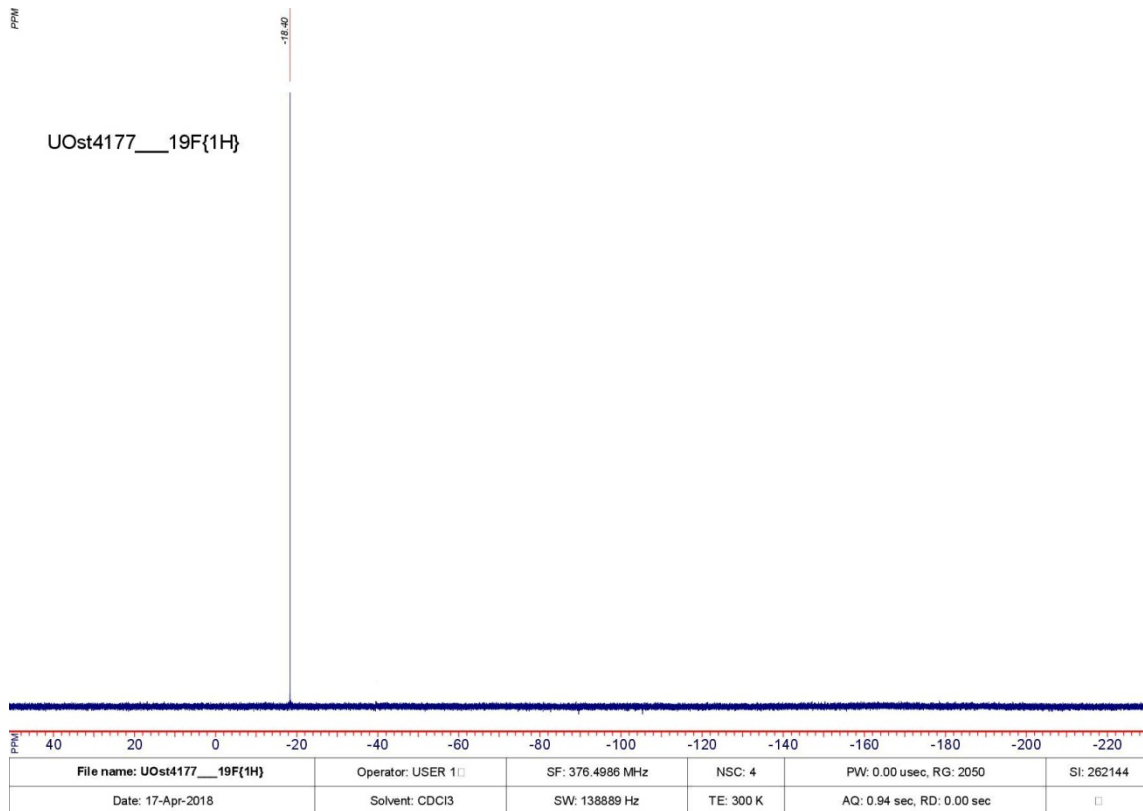
2.1. 2-(Bromodifluoromethoxy)-5-chloropyrazine 3 (¹H NMR).



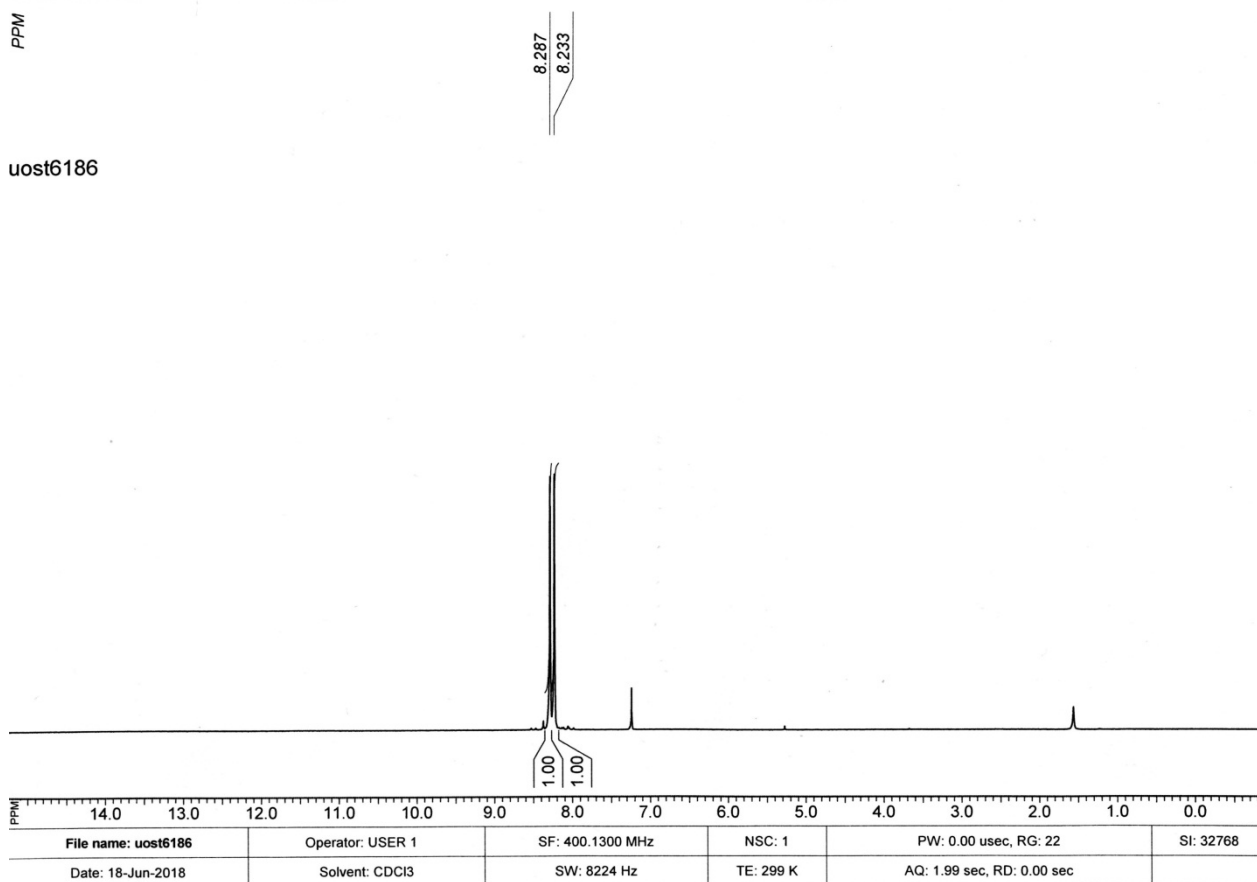
2.2. 2-(Bromodifluoromethoxy)-5-chloropyrazine 3 (¹³C NMR)



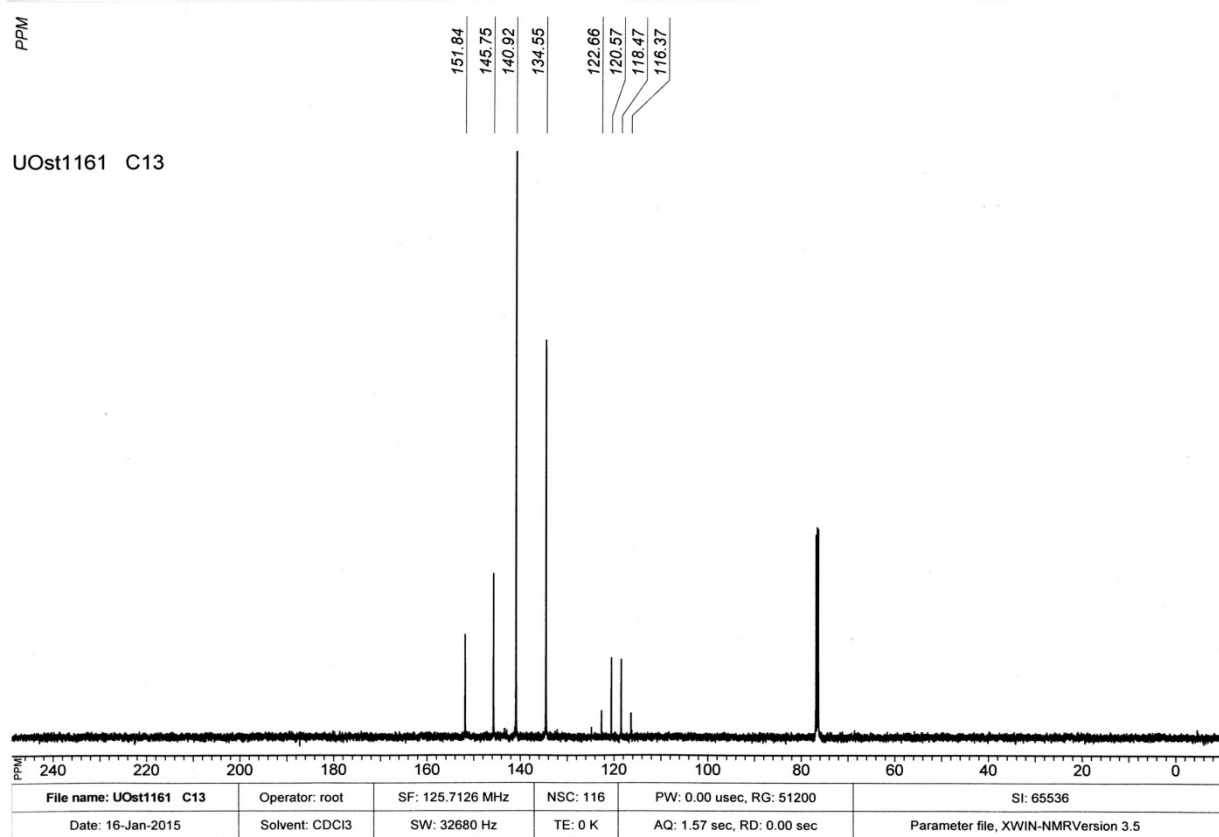
2.3. 2-(Bromodifluoromethoxy)-5-chloropyrazine 3 (¹⁹F NMR).



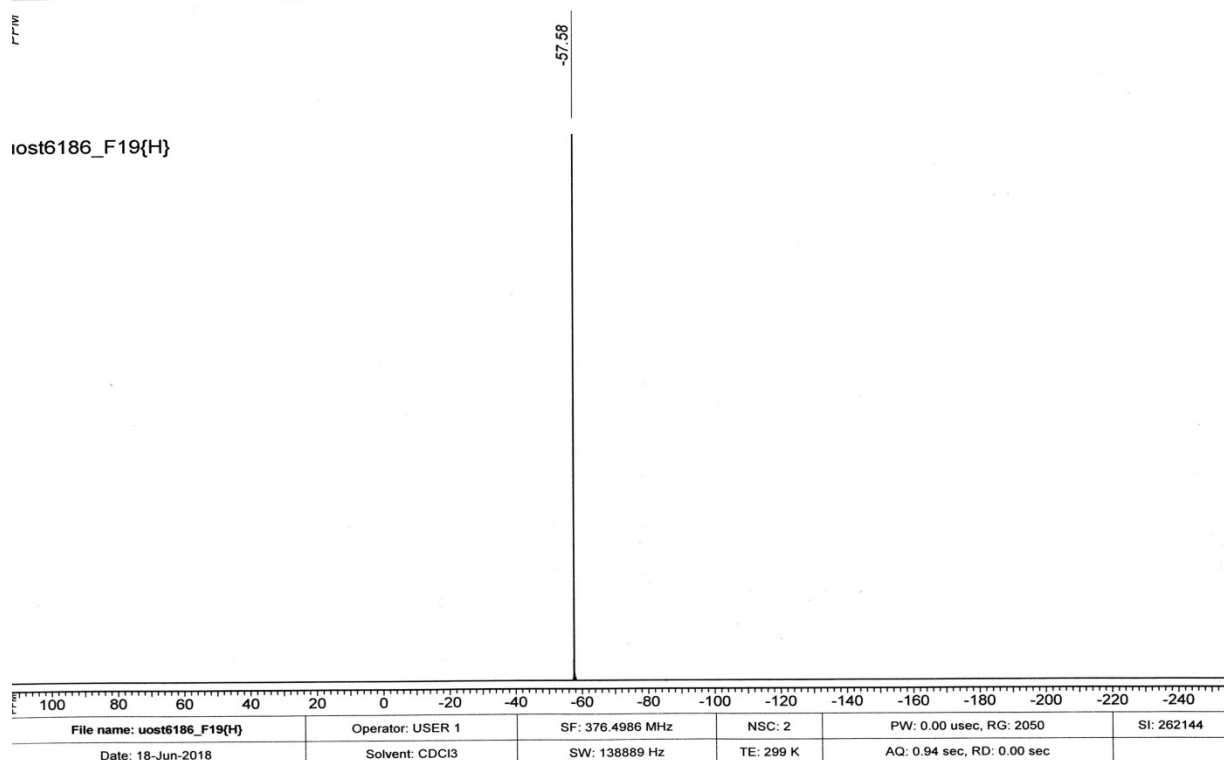
3.1. 2-Chloro-5-trifluoromethoxy pyrazine 4 (¹H NMR).



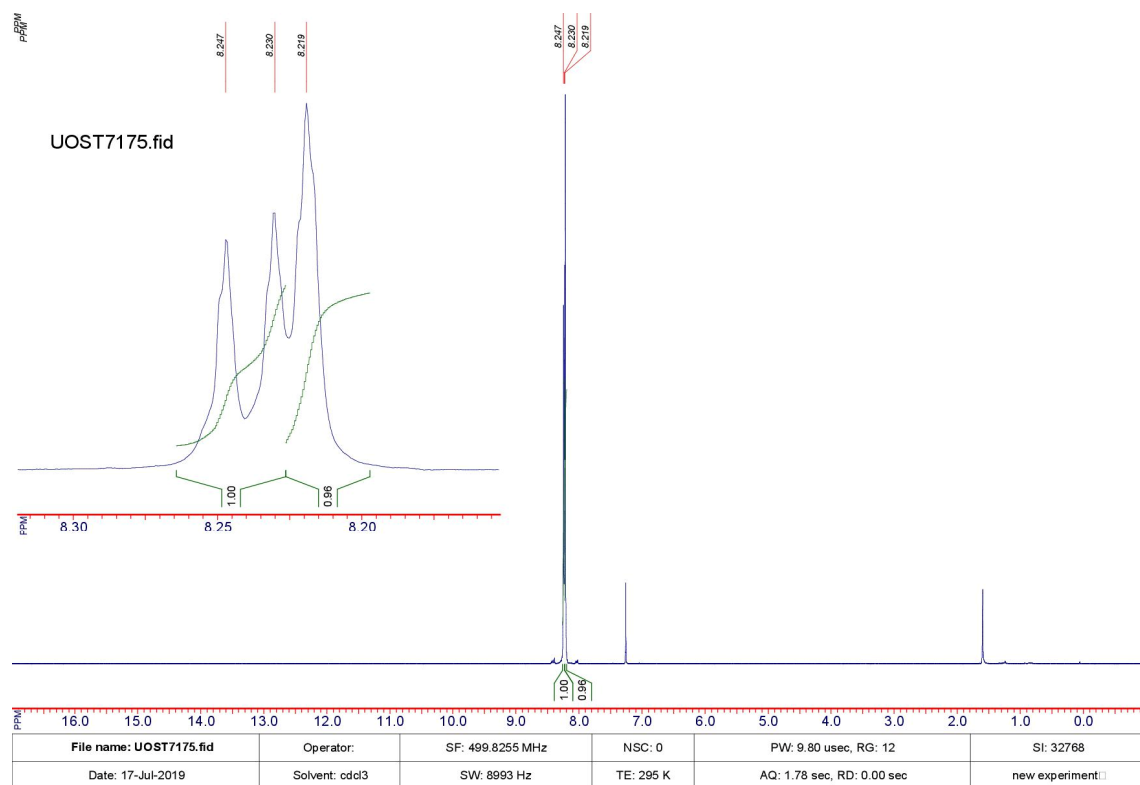
3.2. 2-Chloro-5-trifluoromethoxy pyrazine **4** (^{13}C NMR).



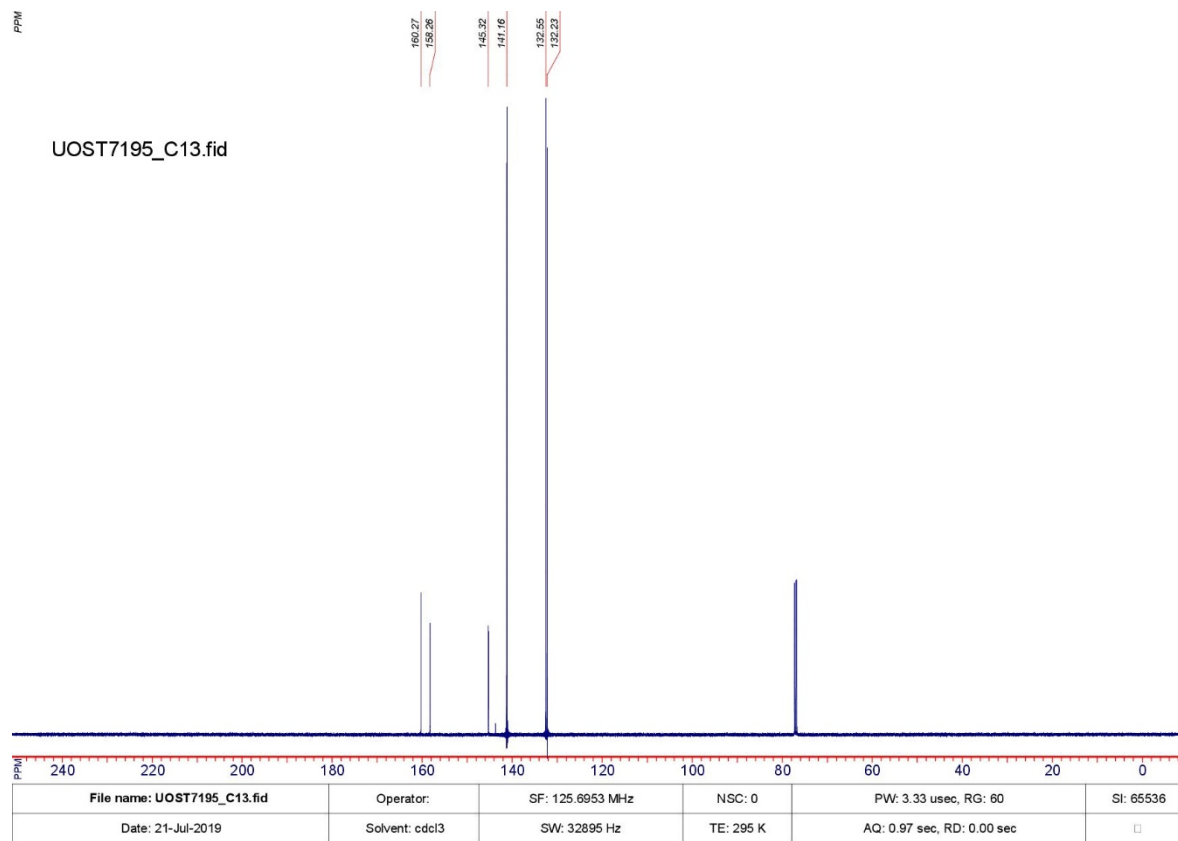
3.3. 2-Chloro-5-trifluoromethoxy pyrazine **4** (^{19}F NMR).



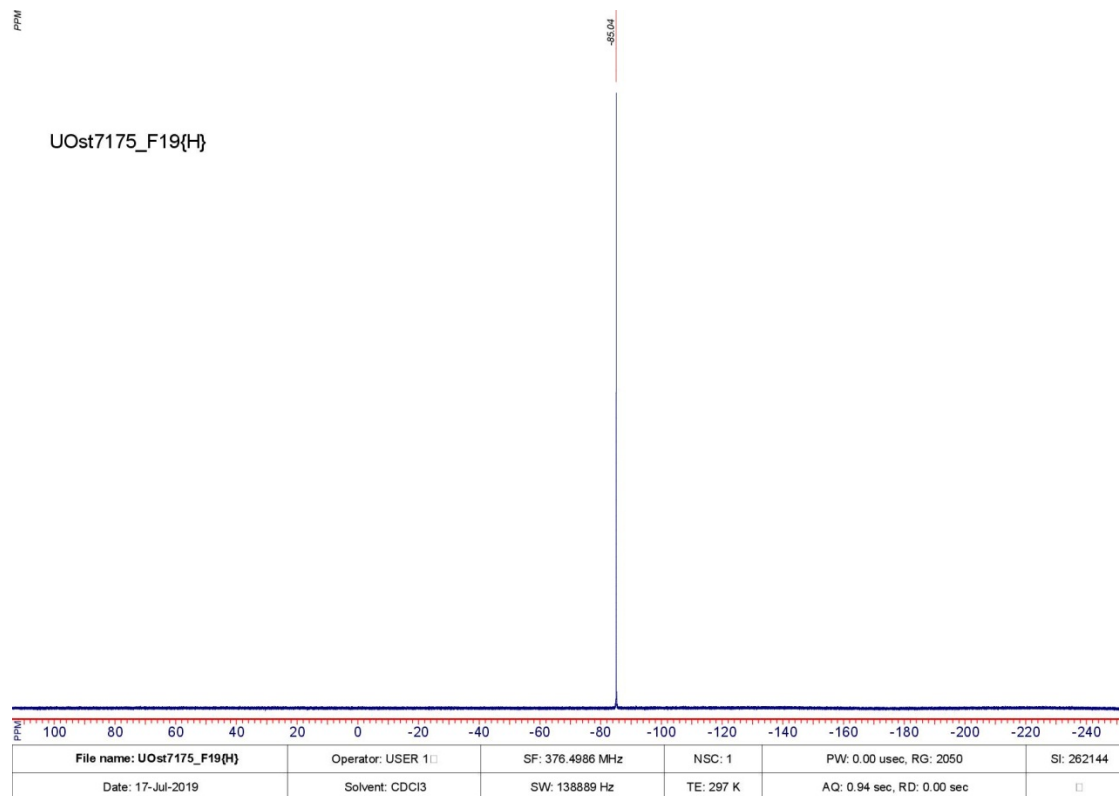
4.1. 2-Chloro-5-fluoropyrazine 5 (^1H NMR).



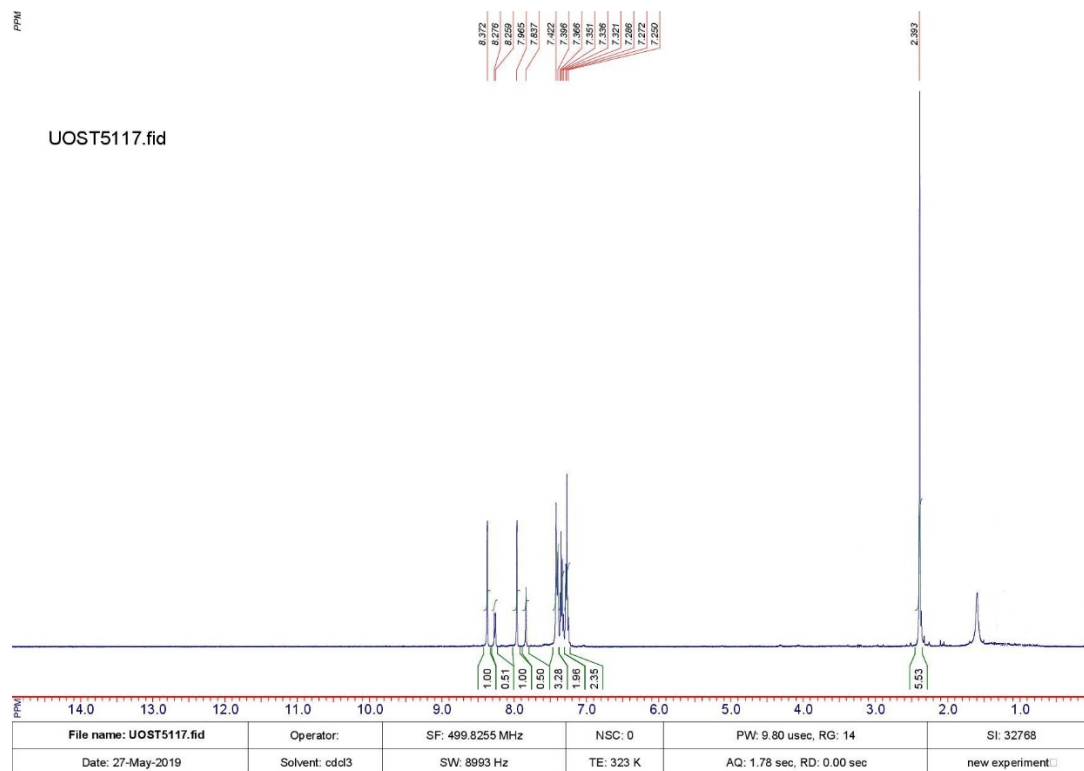
4.2. 2-Chloro-5-fluoropyrazine 5 (^{13}C NMR).



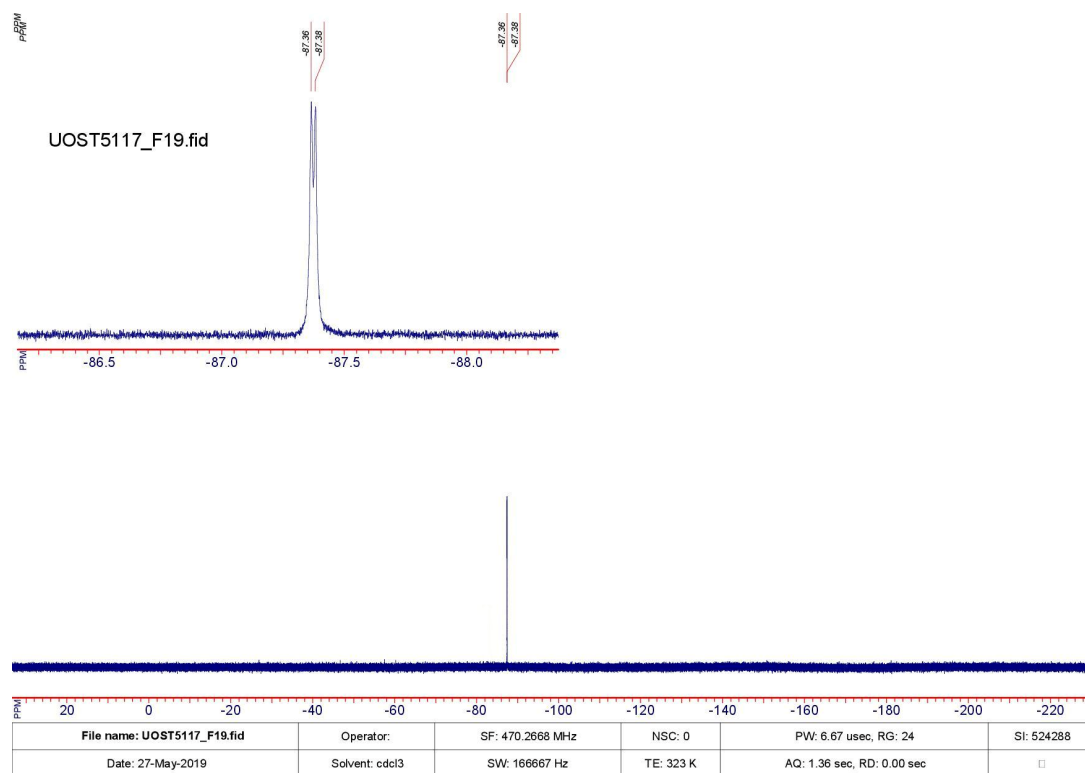
4.3. 2-Chloro-5-fluoropyrazine 5 (^{19}F NMR).



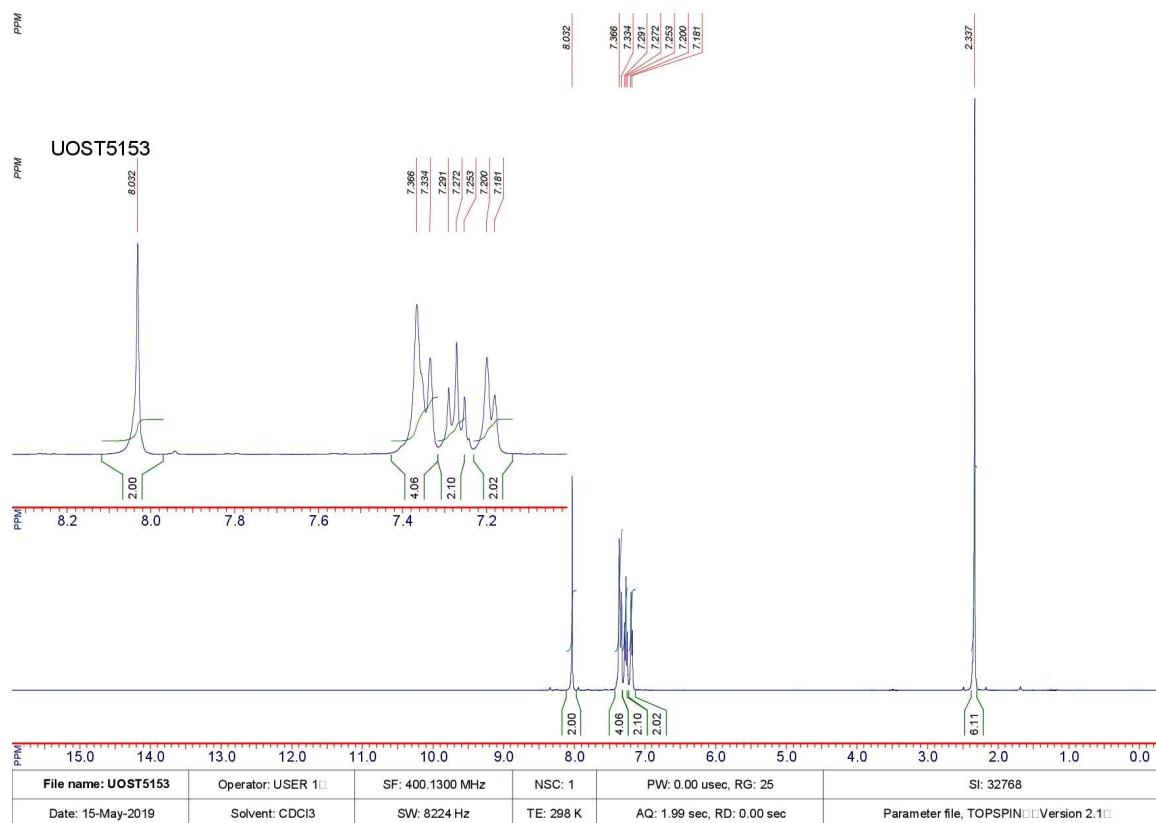
5.1. The mixture of 2-chloro-5-(*m*-tolylthio)pyrazine 6 and 2-fluoro-5(*m*-tolylthio)pyrazine 7 (^1H NMR).



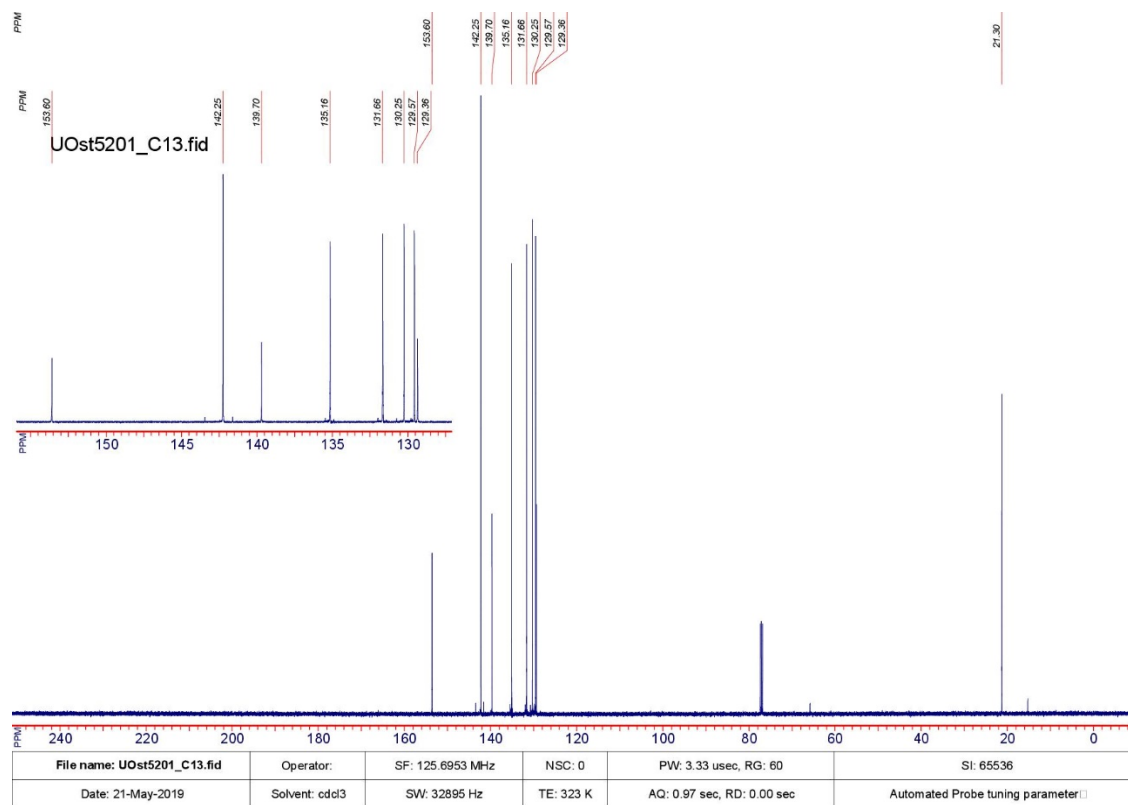
5.2. The mixture of 2-chloro-5-(*m*-tolylthio)pyrazine 6 and 2-fluoro-5-(*m*-tolylthio)pyrazine 7 (^{19}F NMR).



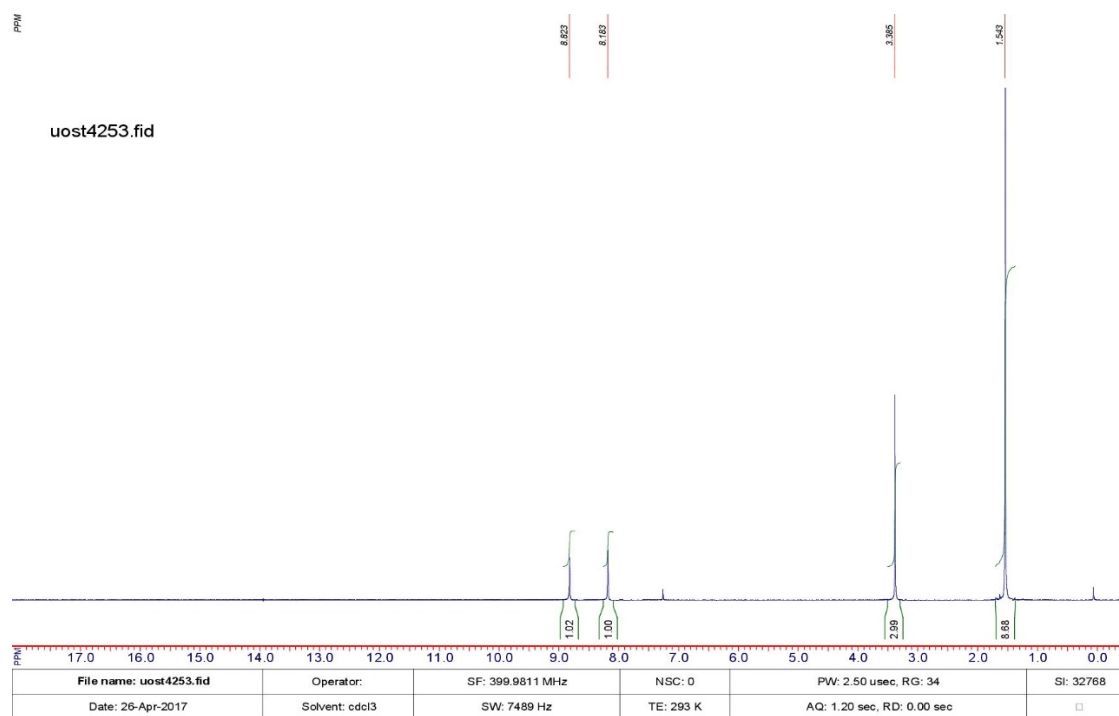
6.1. 2,5-Bis(*m*-tolylthio)pyrazine 8 (^1H NMR).



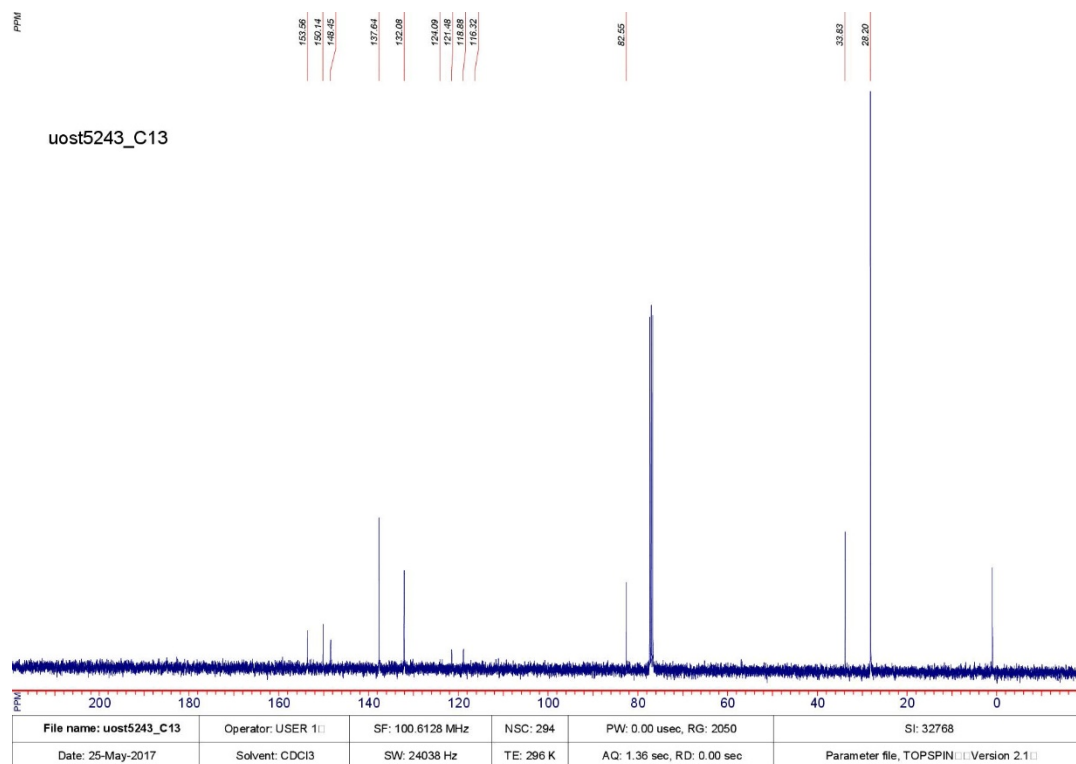
6.2. 2,5-Bis(*m*-tolylthio)pyrazine **8** (^{13}C NMR).



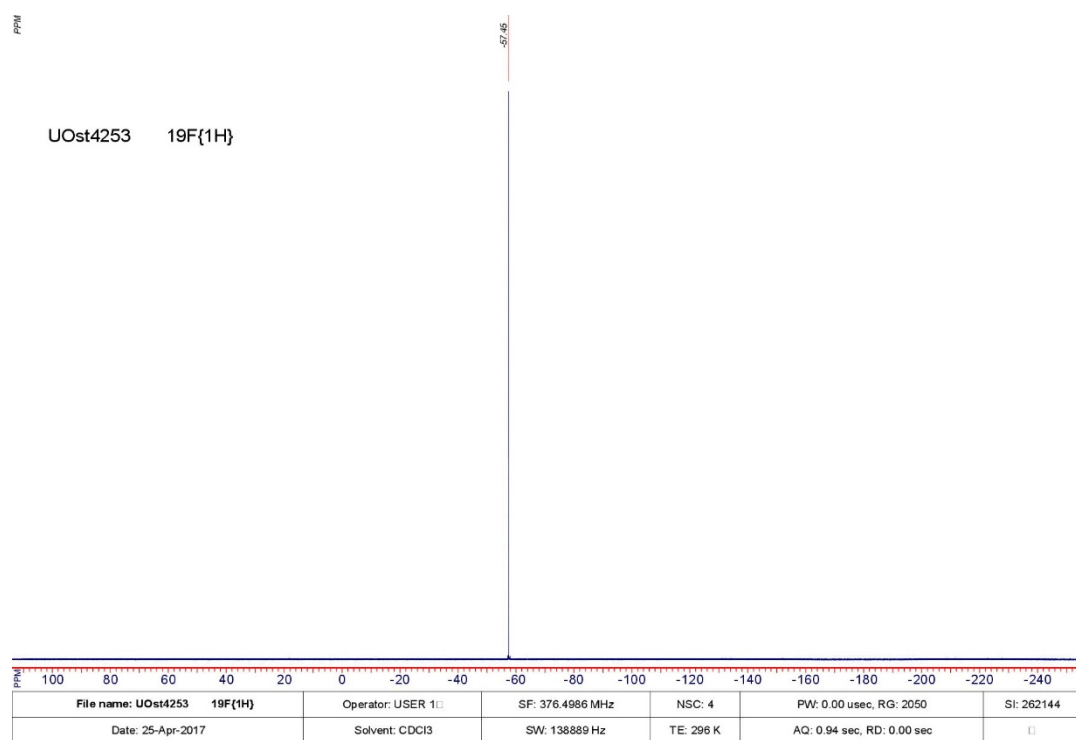
7.1. *tert*-Butyl methyl(5-(trifluoromethoxy)pyrazin-2-yl)carbamate **9** (^1H NMR).



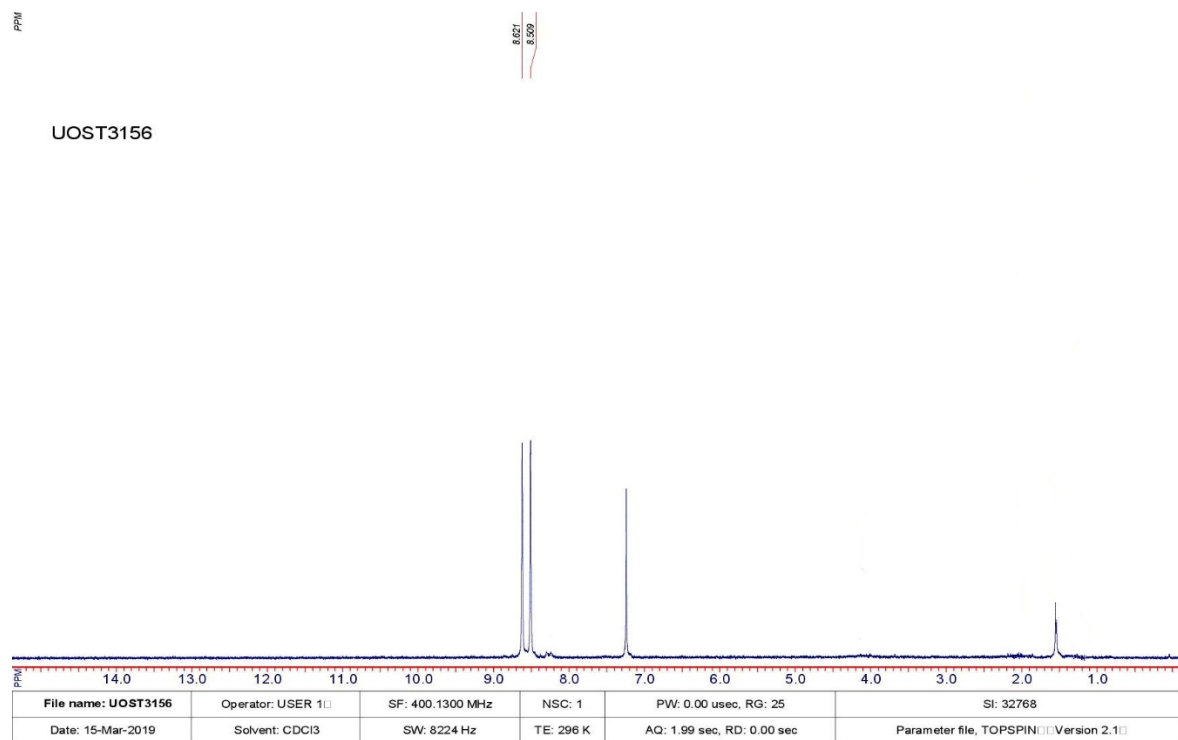
7.2. *tert*-Butyl methyl(5-(trifluoromethoxy)pyrazin-2-yl)carbamate **9** (^{13}C NMR).



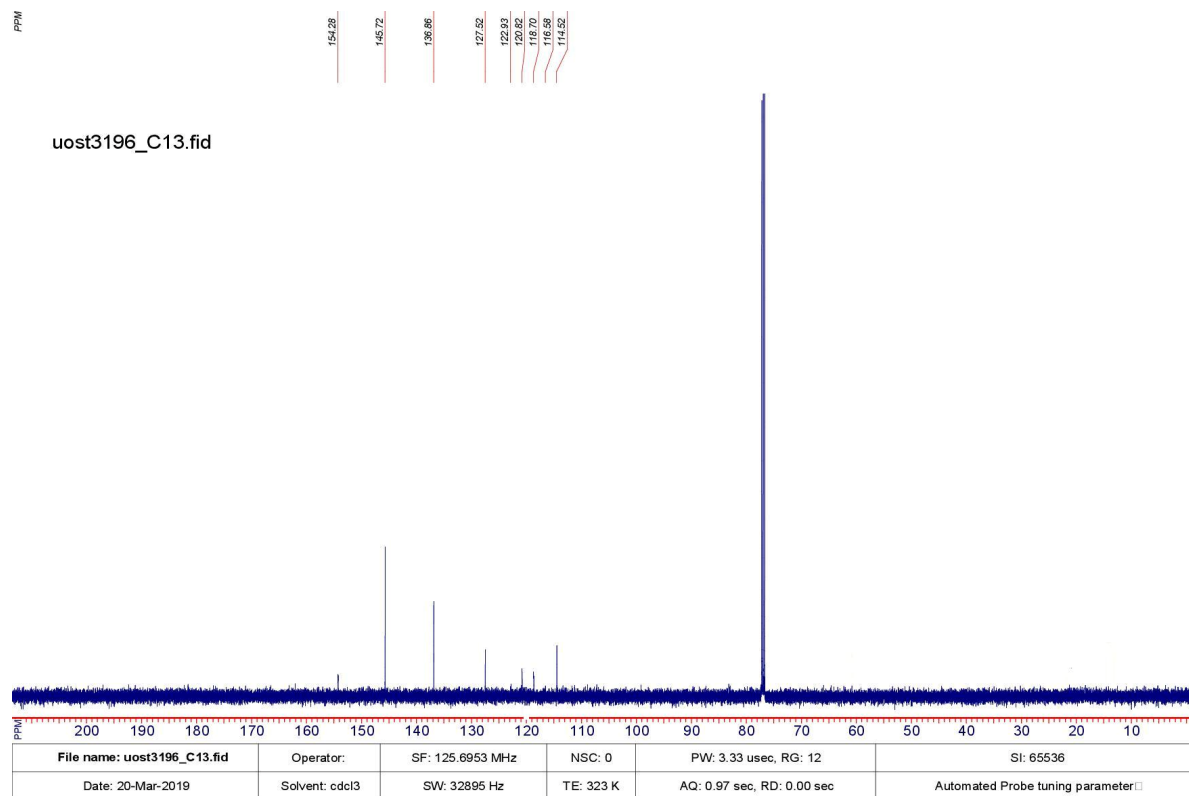
7.3. *tert*-Butyl methyl(5-(trifluoromethoxy)pyrazin-2-yl)carbamate **9** (^{19}F NMR).



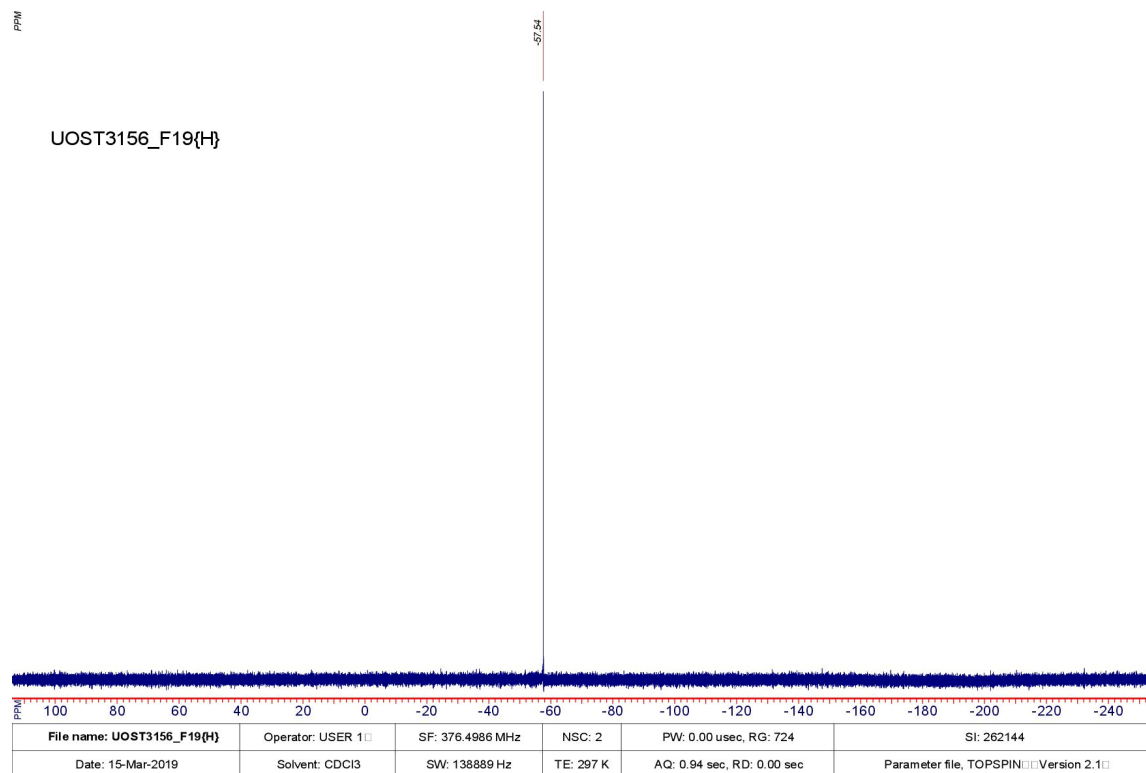
8.1. 5-(Trifluoromethoxy)pyrazine-2-carbonitrile **10** (^1H NMR).



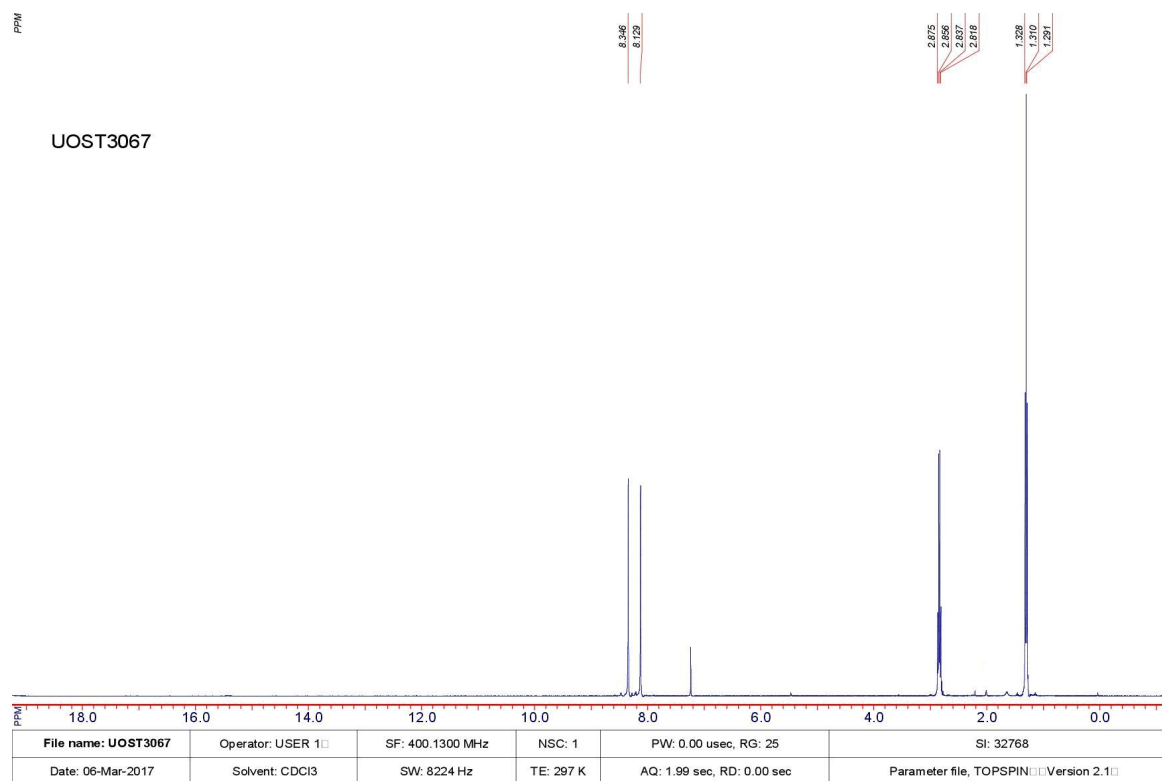
8.2. 5-(Trifluoromethoxy)pyrazine-2-carbonitrile **10** (^{13}C NMR).



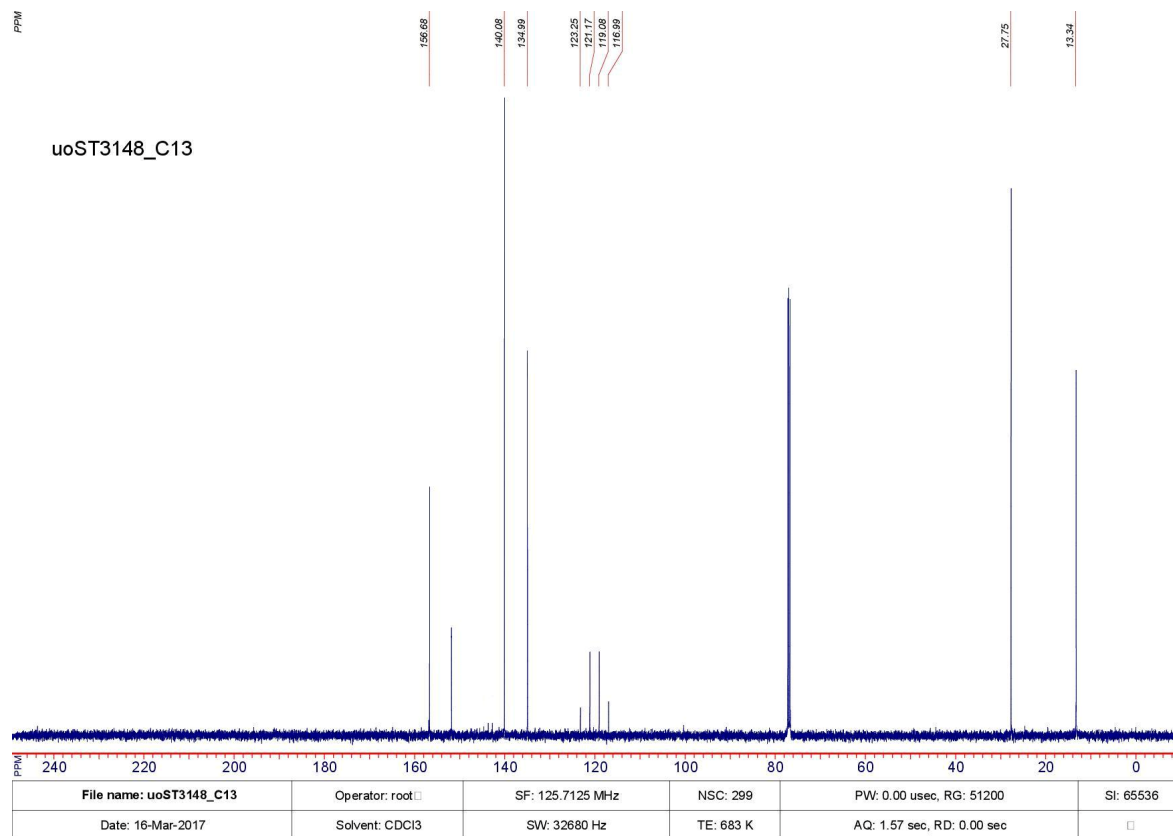
8.3. 5-(Trifluoromethoxy)pyrazine-2-carbonitrile **10** (^{19}F NMR).



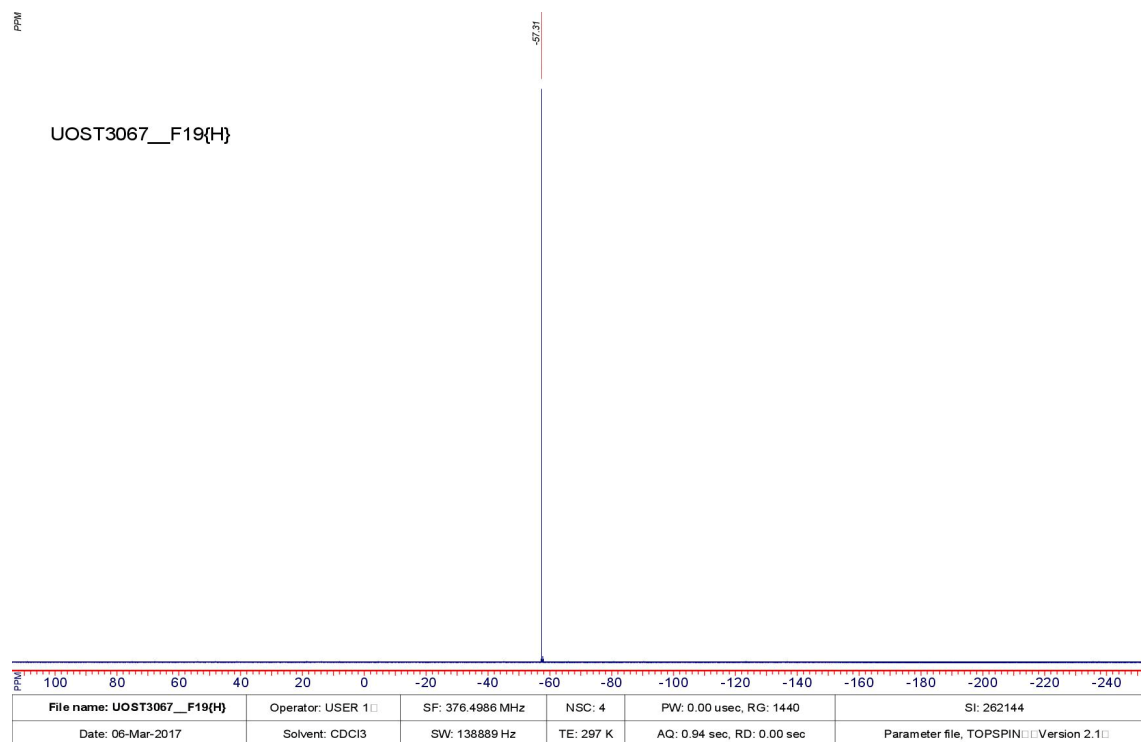
9.1. 2-Ethyl-5-(trifluoromethoxy)pyrazine **11** (^1H NMR).



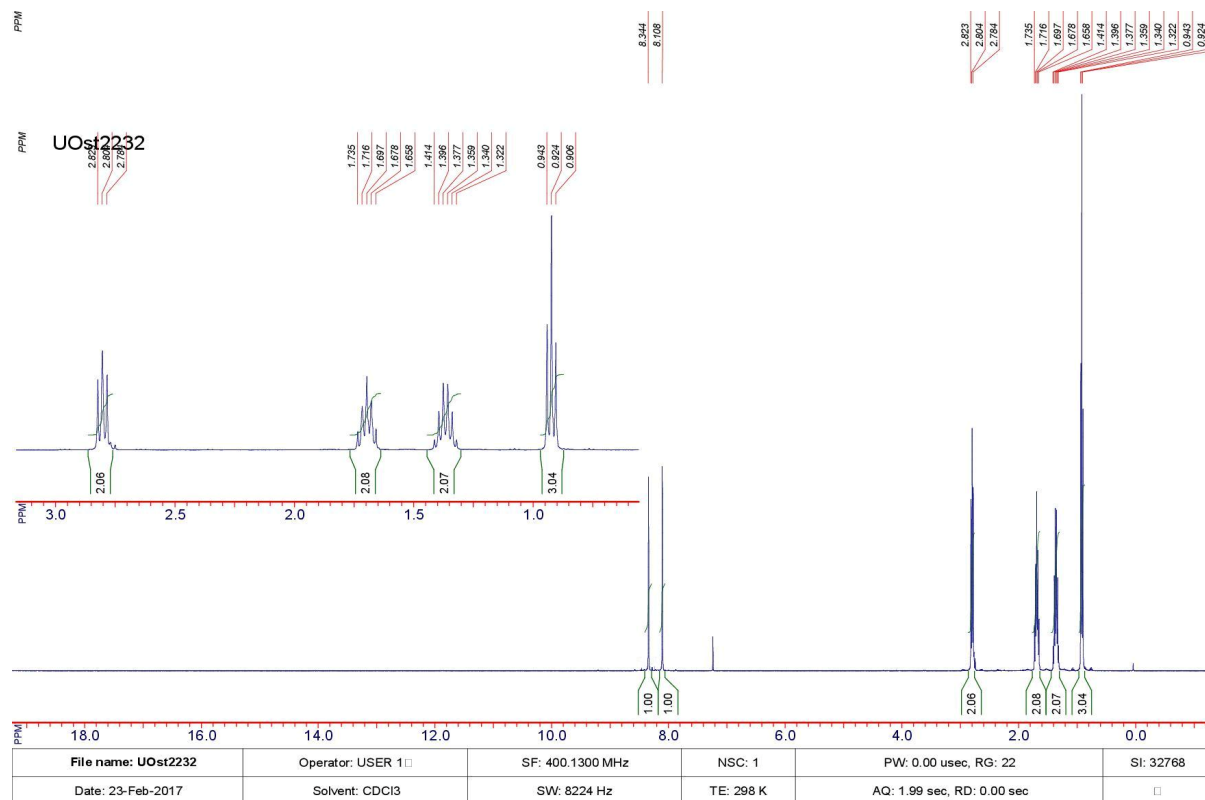
9.2. 2-Ethyl-5-(trifluoromethoxy)pyrazine **11** (¹³C NMR).



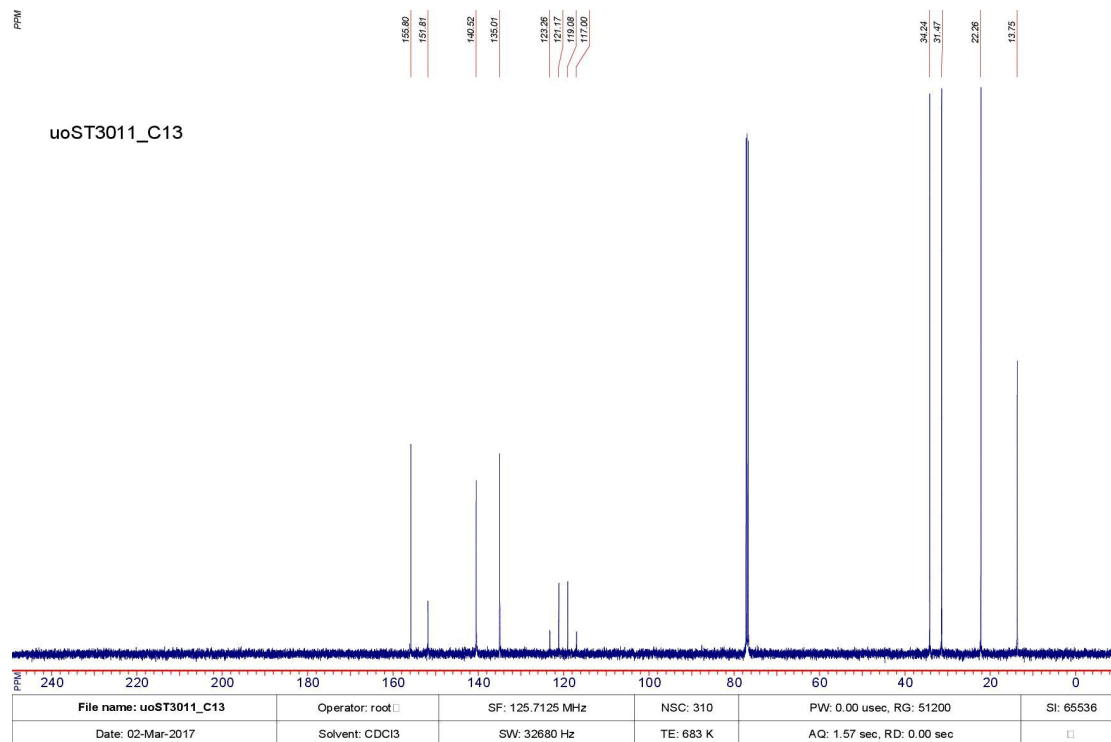
9.3. 2-Ethyl-5-(trifluoromethoxy)pyrazine **11** (¹⁹F NMR).



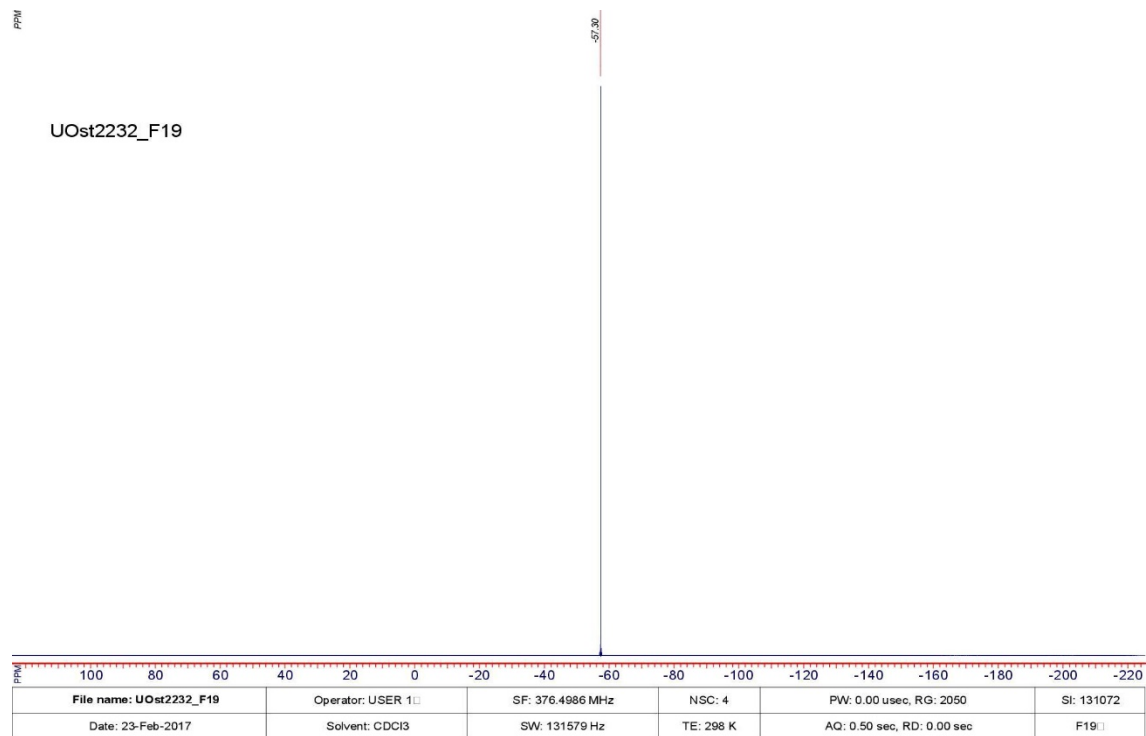
10.1. 2-Butyl-5-(trifluoromethoxy)pyrazine **12** (^1H NMR).



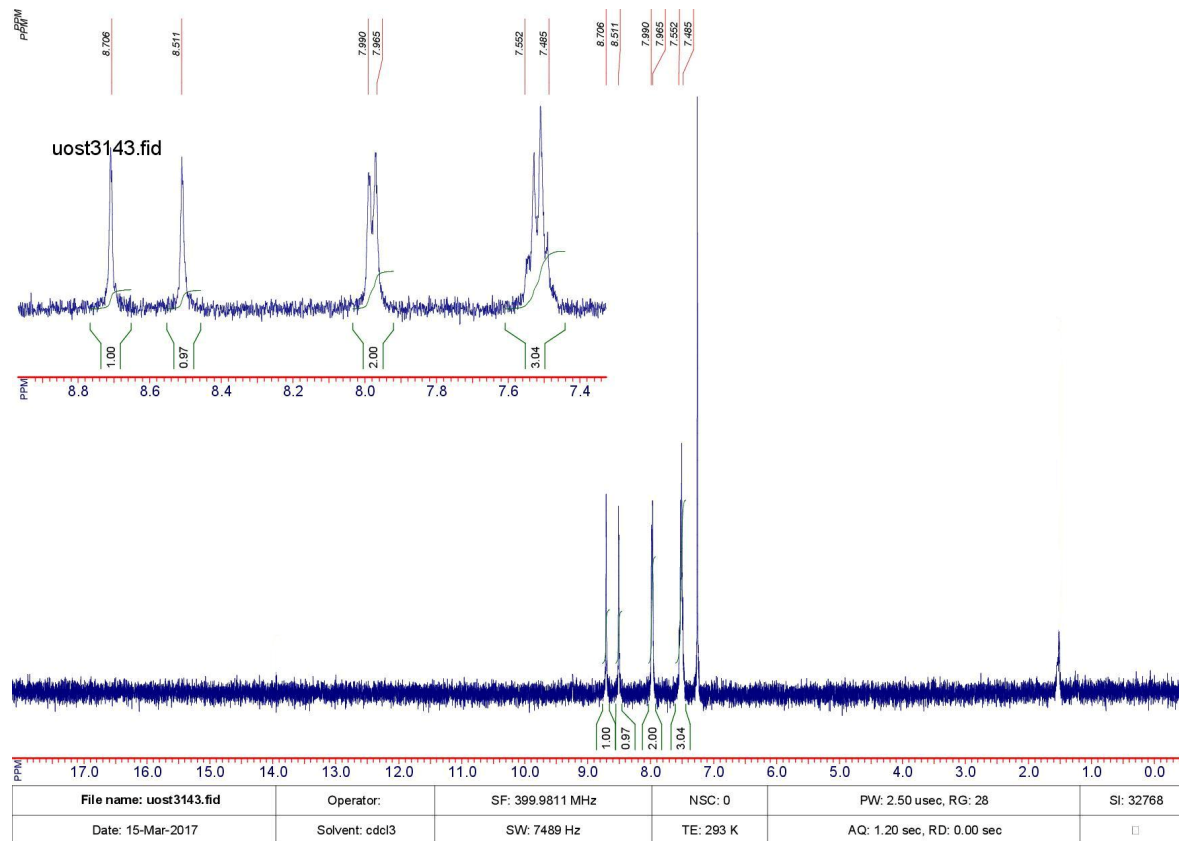
10.2. 2-Butyl-5-(trifluoromethoxy)pyrazine **12** (^{13}C NMR).



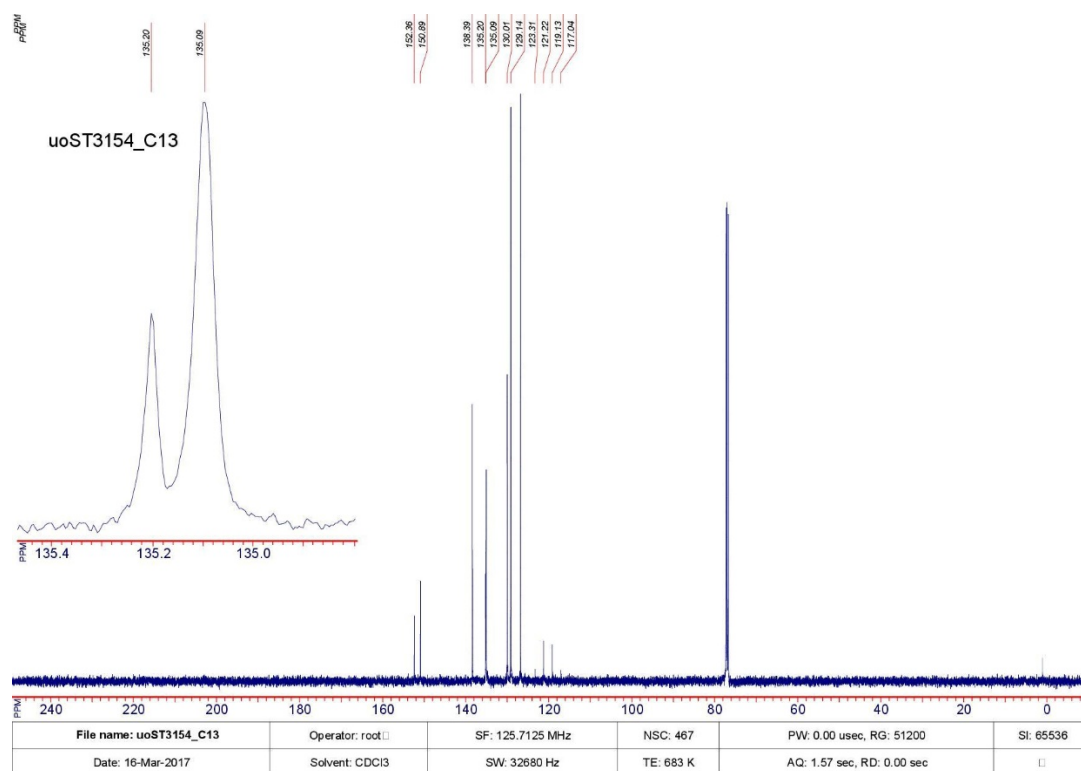
10.3. 2-Butyl-5-(trifluoromethoxy)pyrazine **12** (^{19}F NMR).



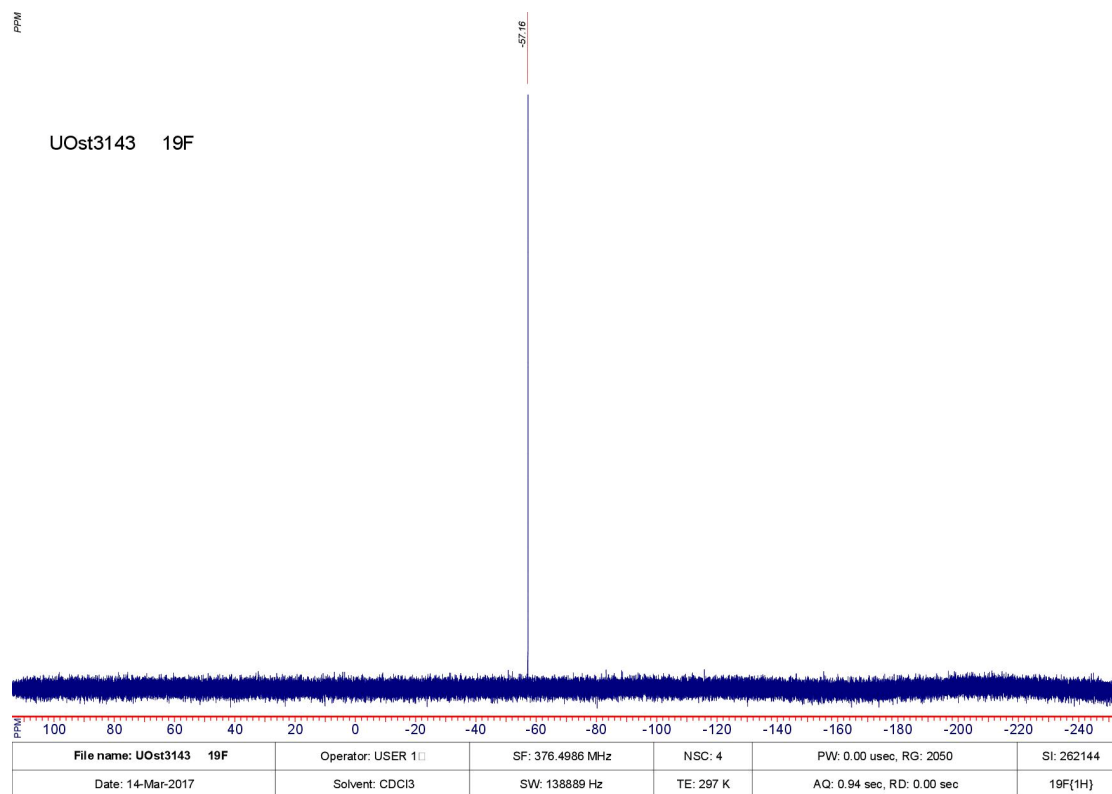
11.1. 2-Phenyl-5-(trifluoromethoxy)pyrazine **13** (^1H NMR).



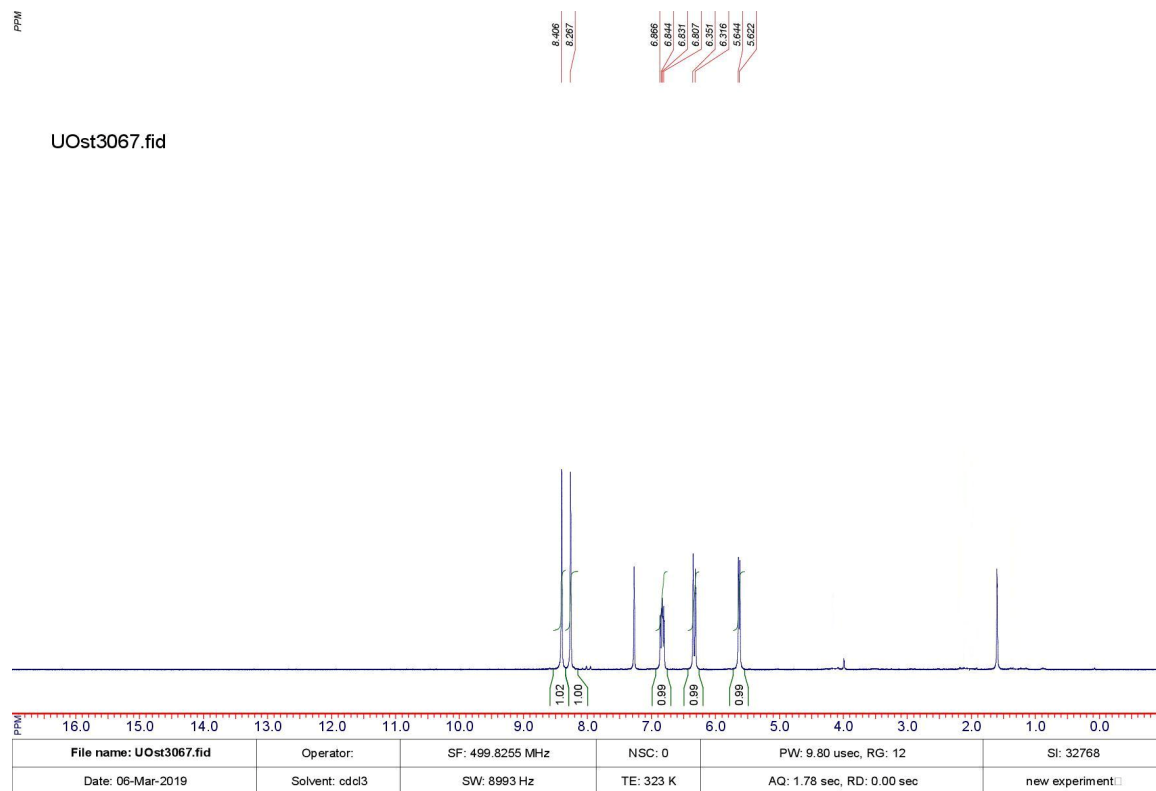
11.2. 2-Phenyl-5-(trifluoromethoxy)pyrazine **13** (^{13}C NMR).



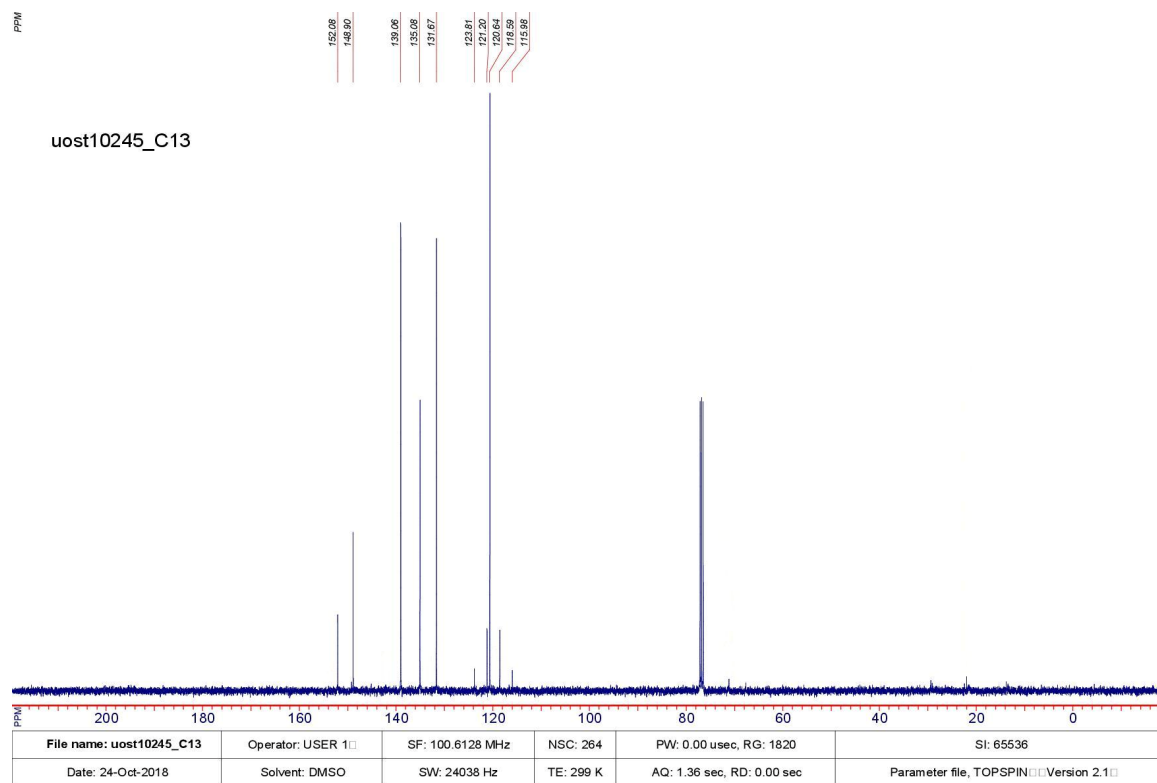
11.3. 2-Phenyl-5-(trifluoromethoxy)pyrazine **13** (^{19}F NMR).



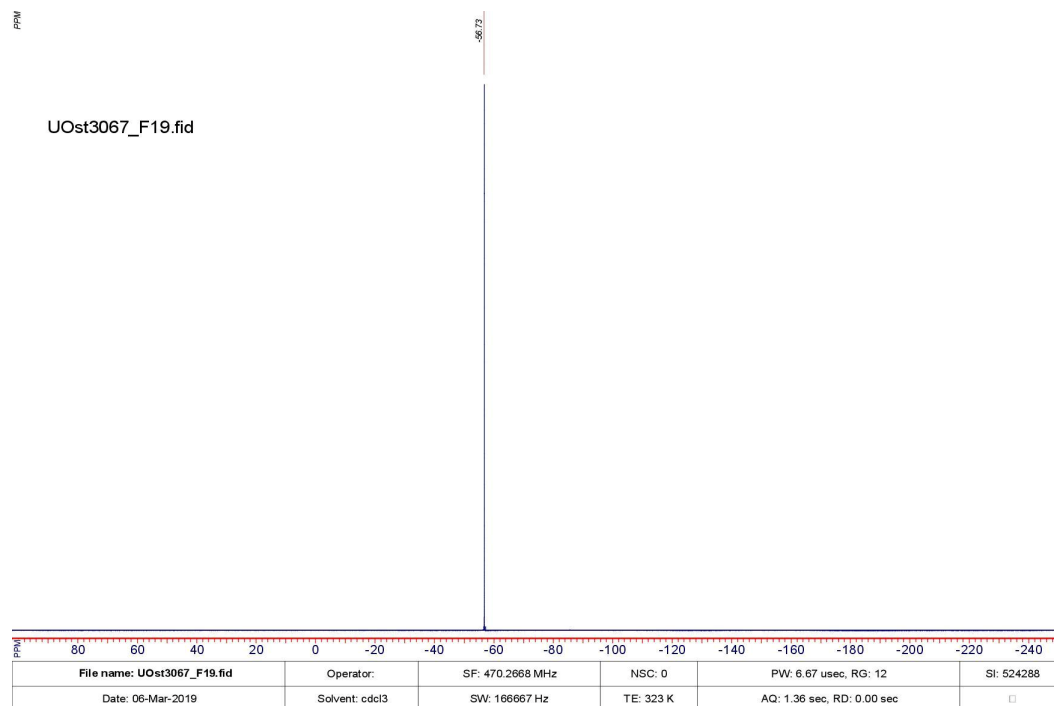
12.1. 2-(Trifluoromethoxy)-5-vinylpyrazine **14** (^1H NMR).



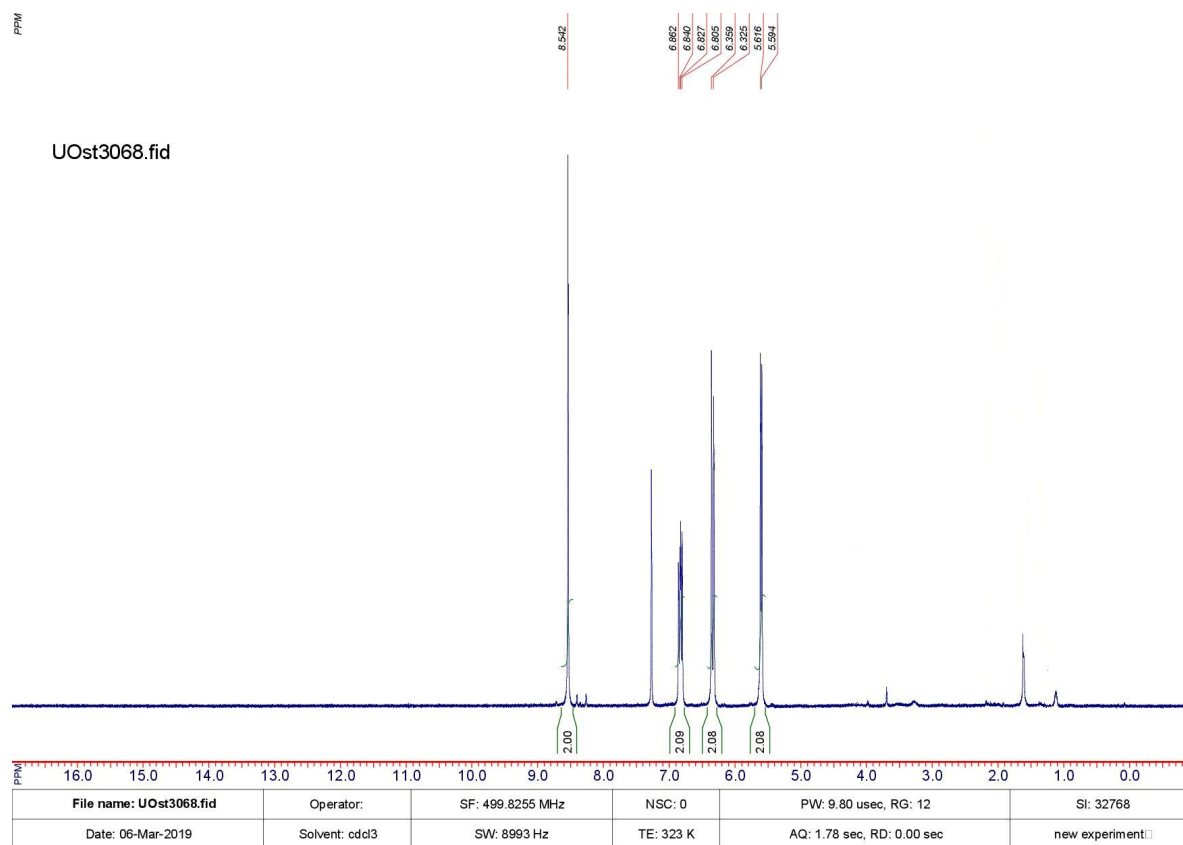
12.2. 2-(Trifluoromethoxy)-5-vinylpyrazine **14** (^{13}C NMR).



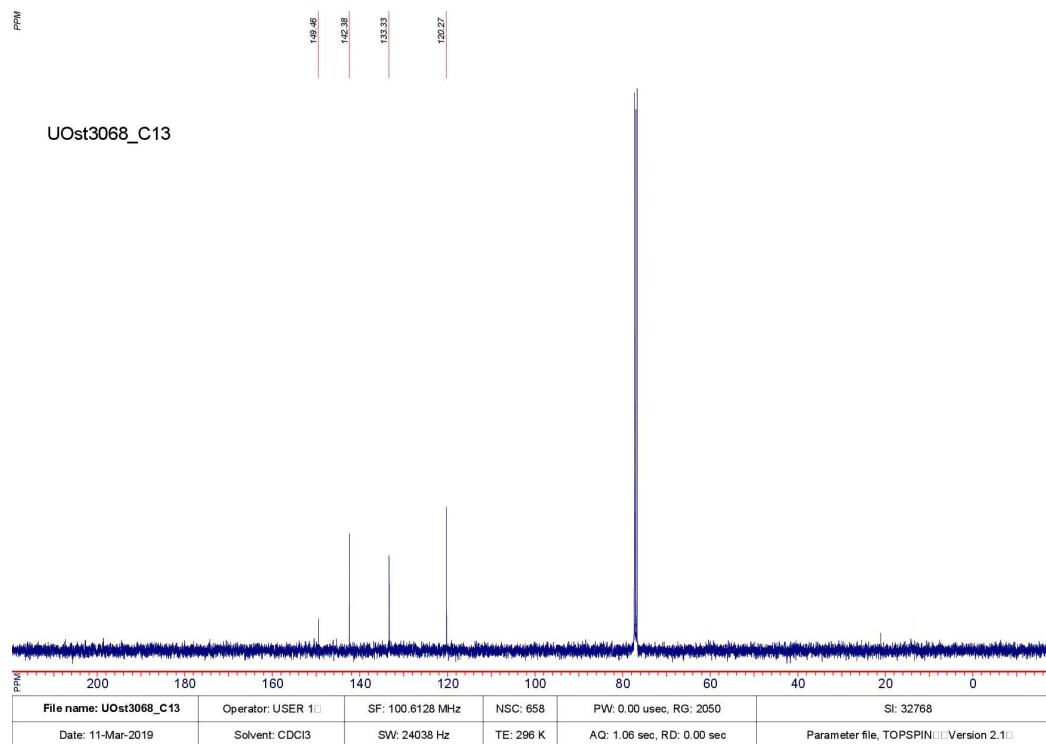
12.3. 2-(Trifluoromethoxy)-5-vinylpyrazine **14** (^{19}F NMR).



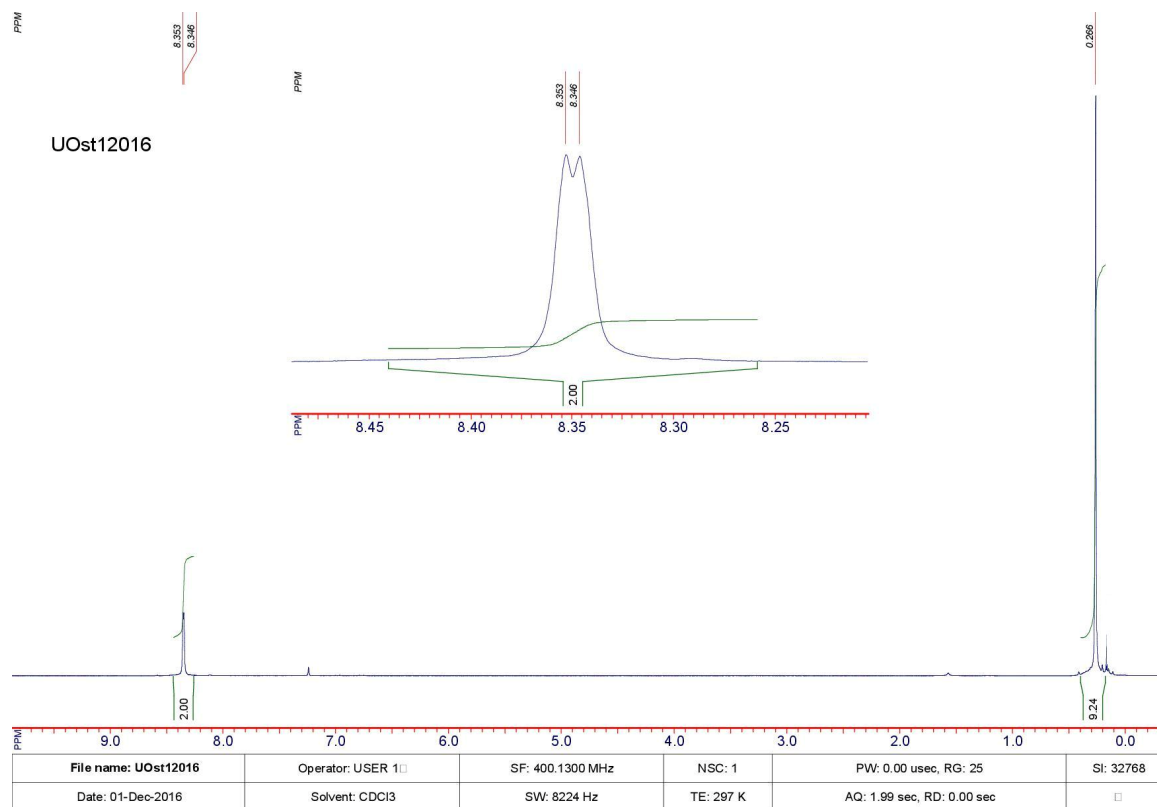
13.1. 2,5-Divinylpyrazine **15** (^1H NMR).



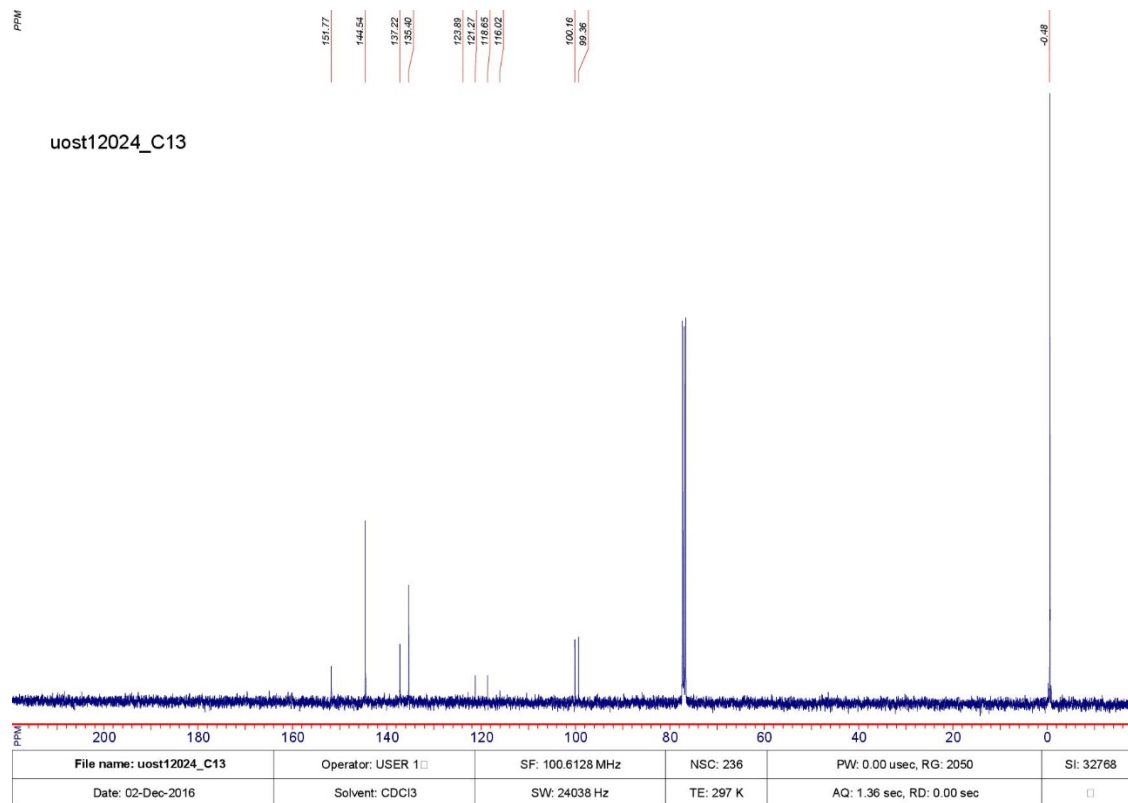
13.2. 2,5-Divinylpyrazine **15** (^{13}C NMR).



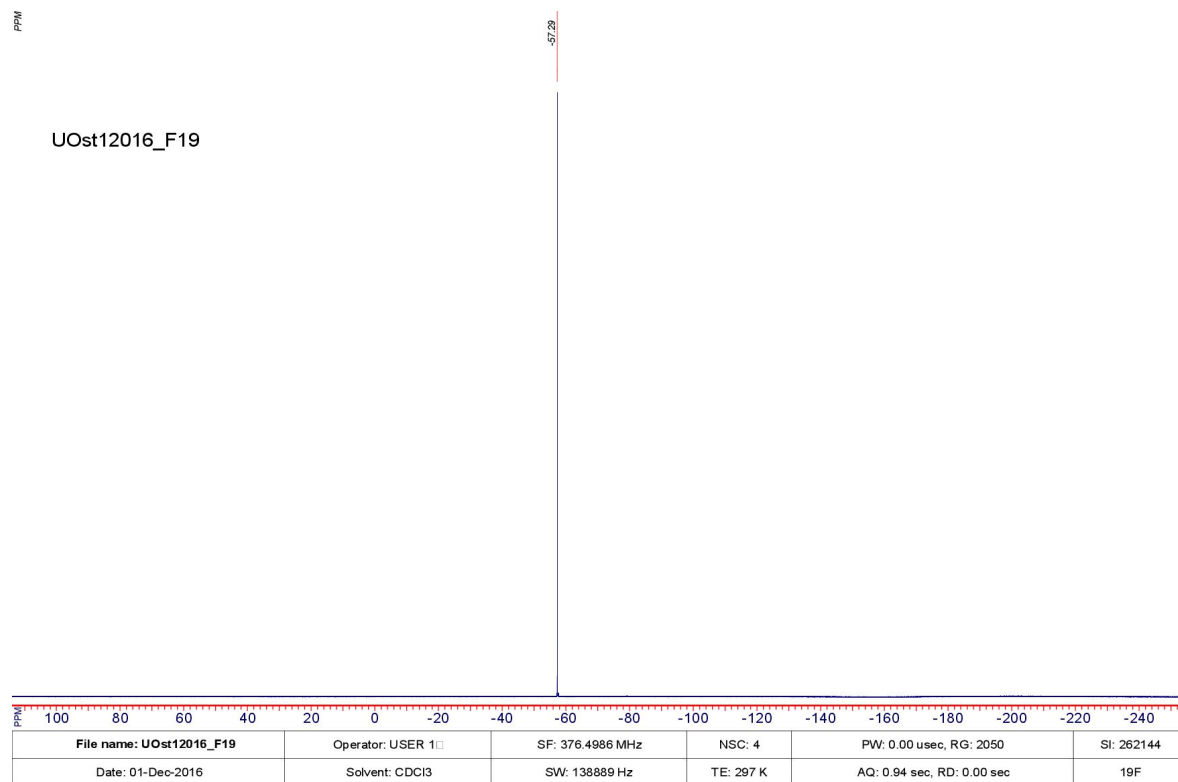
14.1. 2-(Trifluoromethoxy)-5-((trimethylsilyl)ethynyl)pyrazine **16** (^1H NMR).



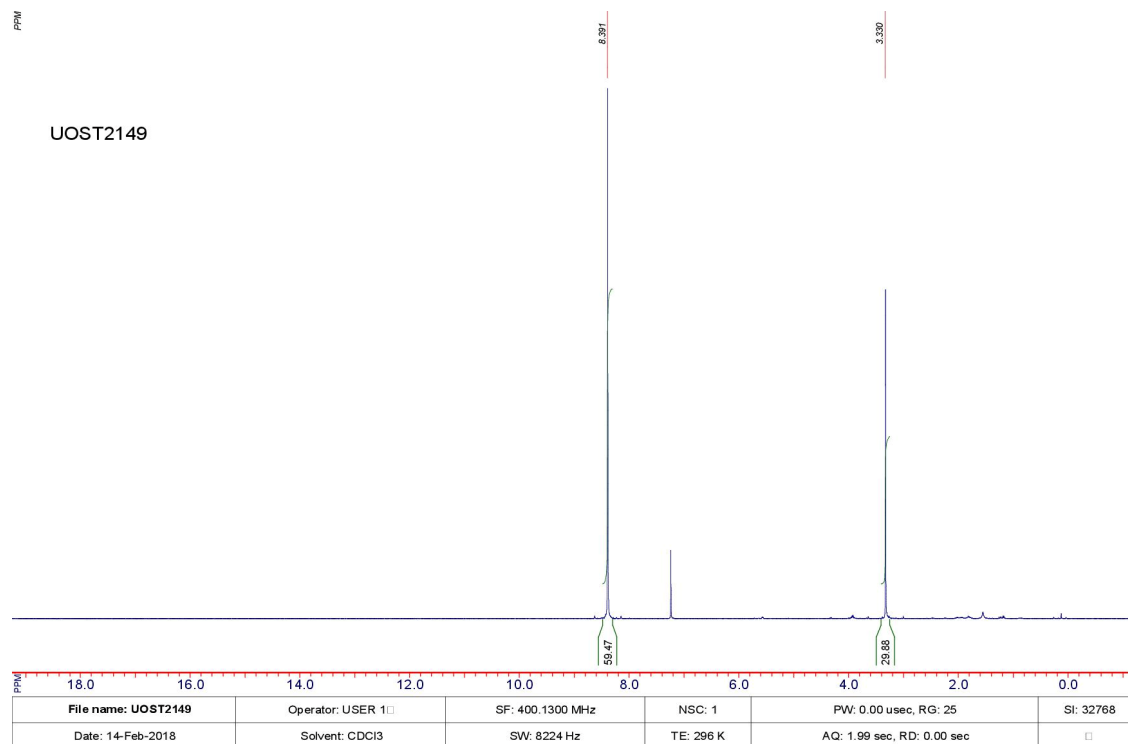
14.2. 2-(Trifluoromethoxy)-5-((trimethylsilyl)ethynyl)pyrazine **16** (^{13}C NMR).



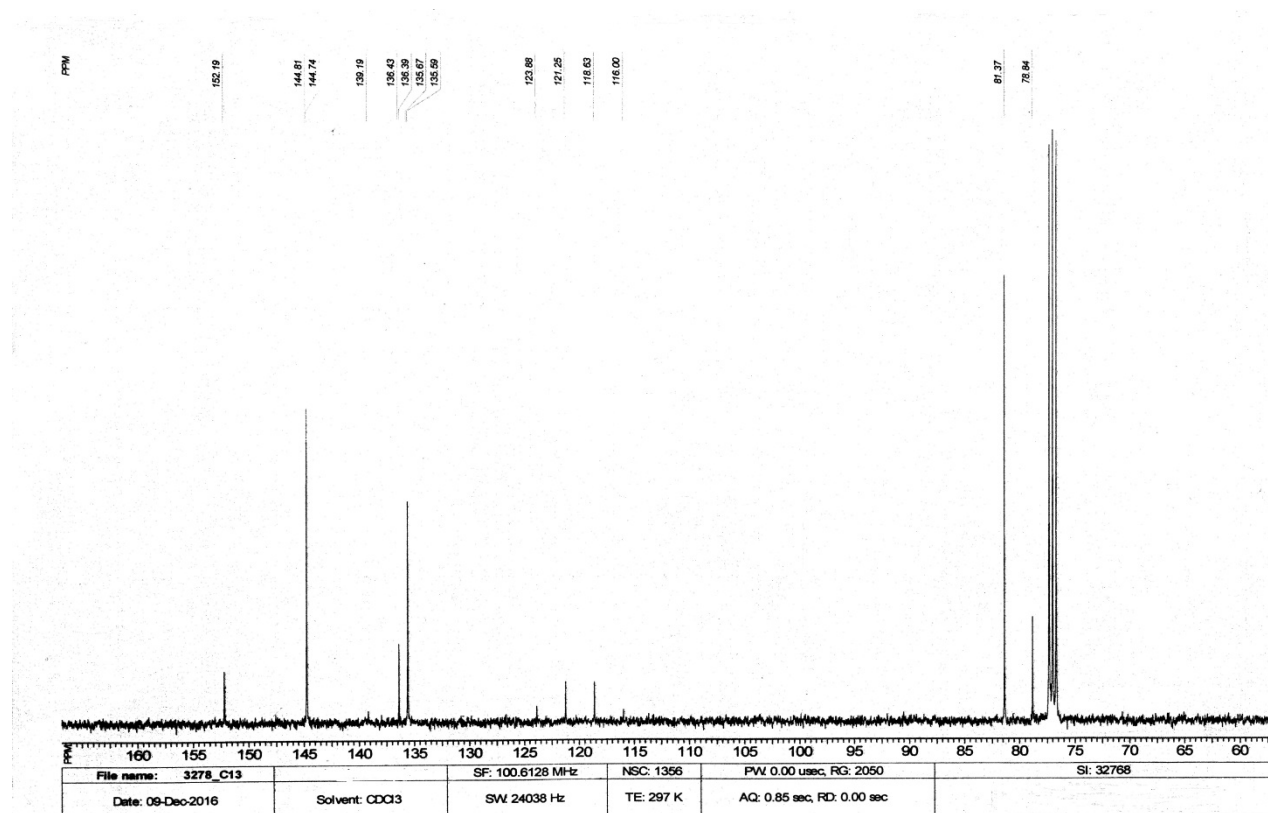
14.3. 2-(Trifluoromethoxy)-5-((trimethylsilyl)ethynyl)pyrazine **16** (^{19}F NMR).



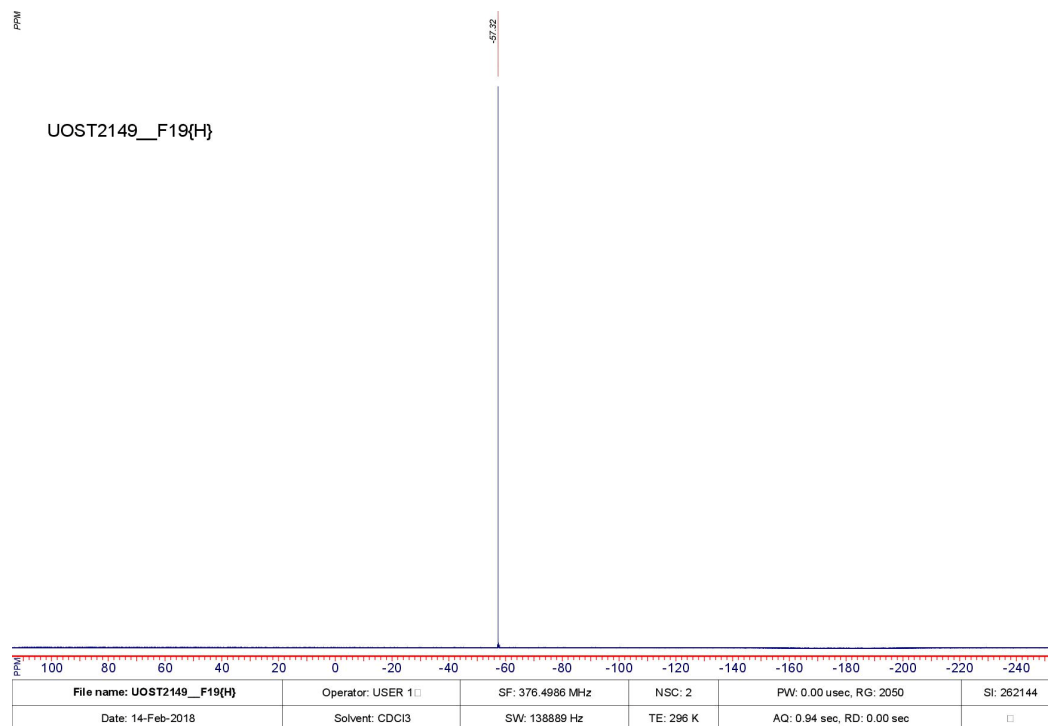
15.1. 2-Ethynyl-5-(trifluoromethoxy)pyrazine 17 (¹H NMR).



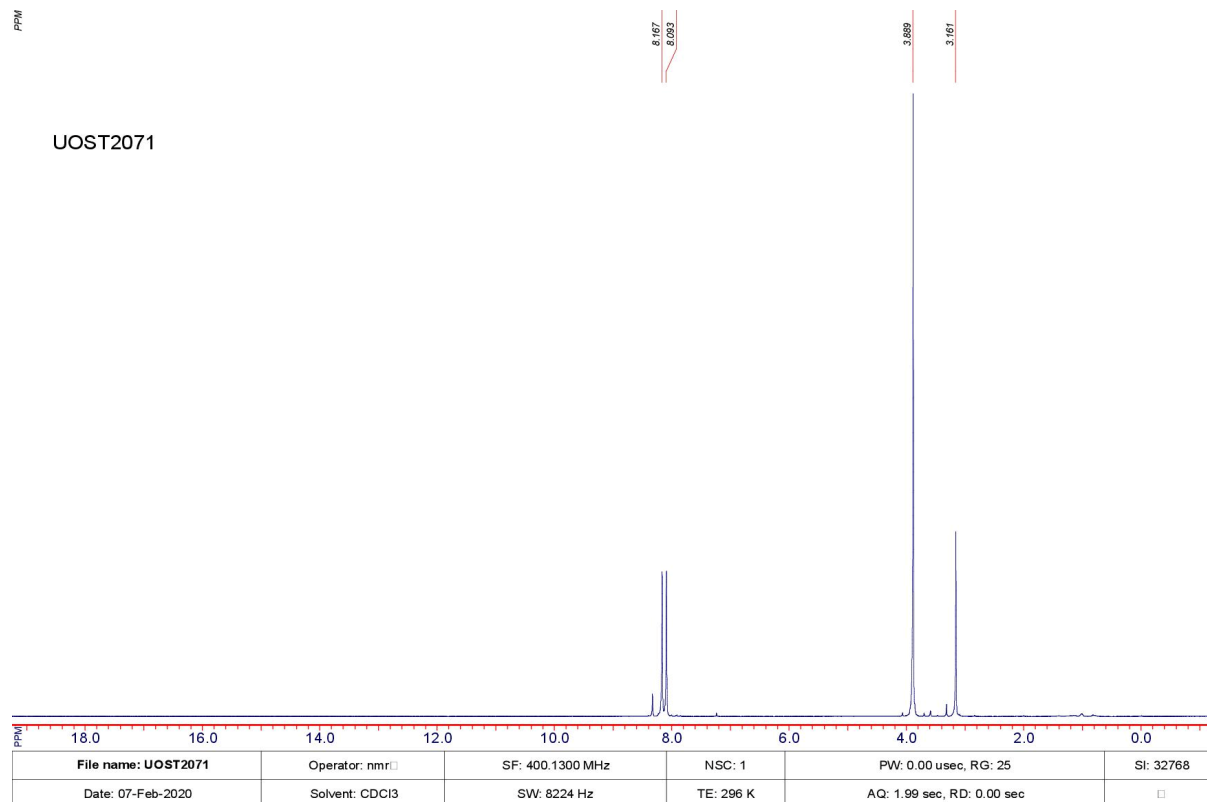
15.2. 2-Ethynyl-5-(trifluoromethoxy)pyrazine 17 (¹³C NMR).



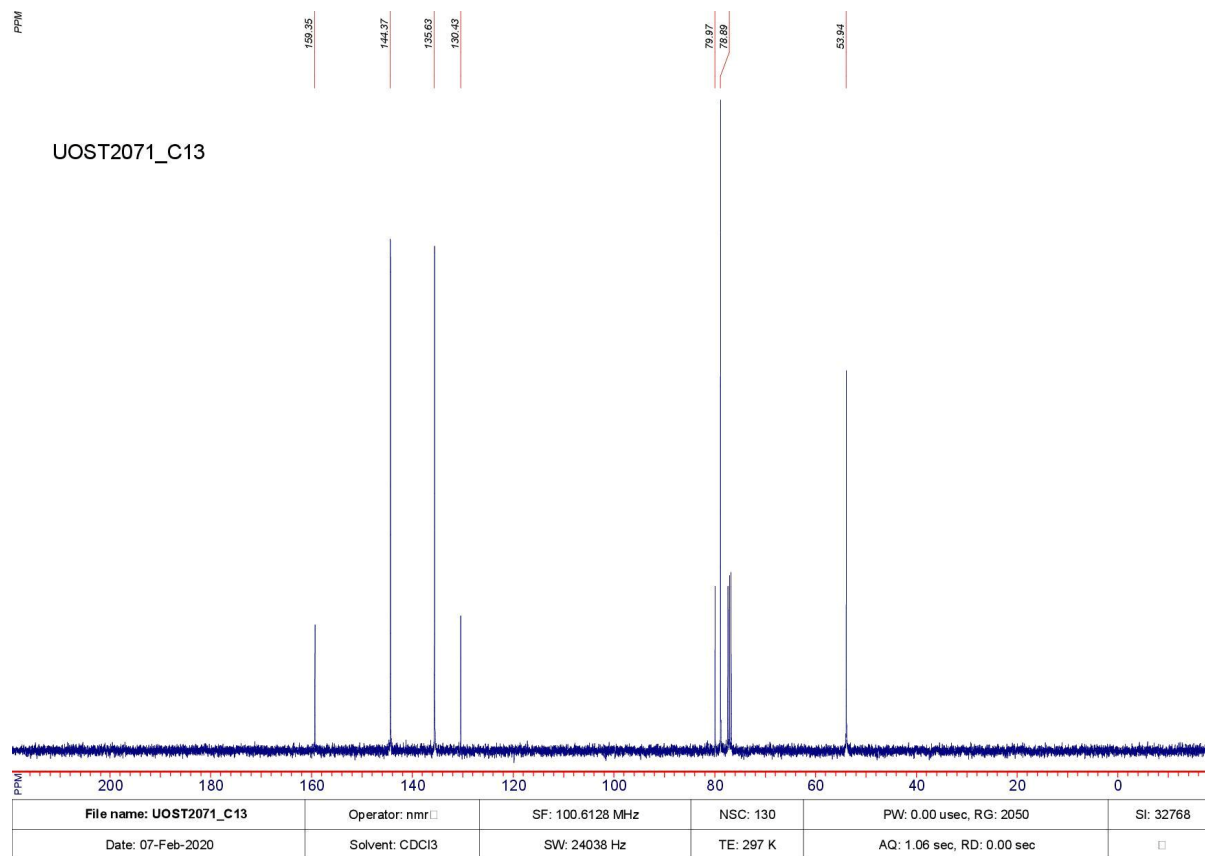
15.3. 2-Ethynyl-5-(trifluoromethoxy)pyrazine **17** (^{19}F NMR).



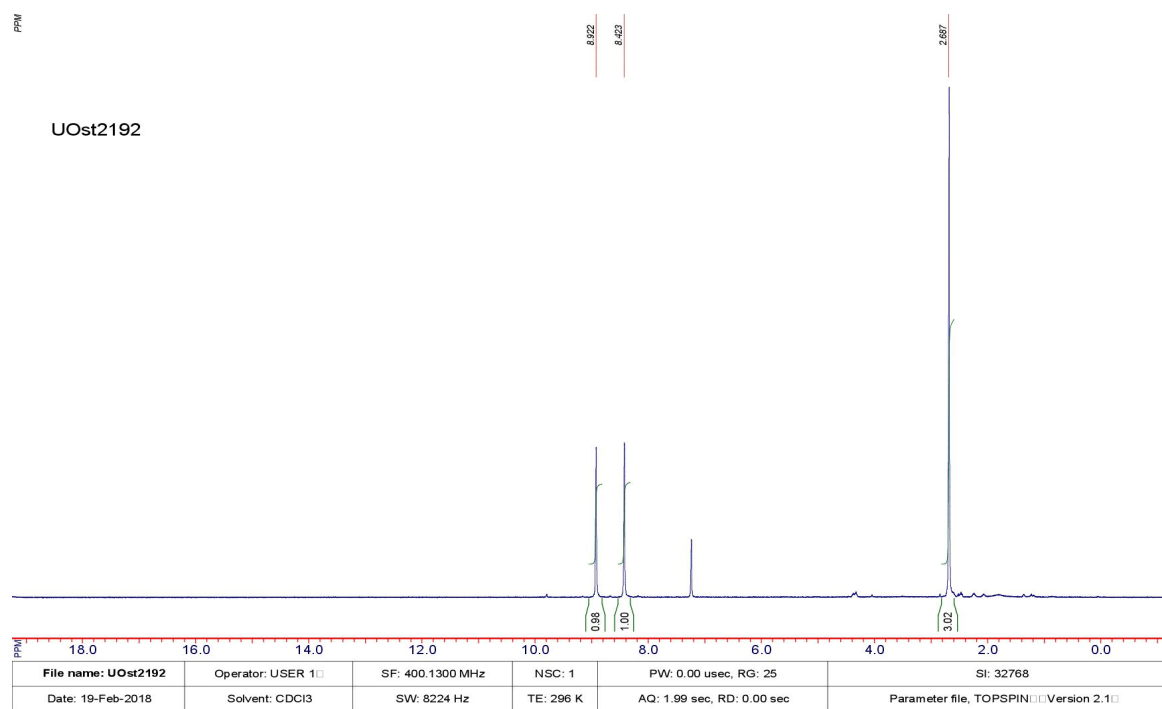
16.1. 2-Ethynyl-5-methoxypyrazine **18** (^1H NMR).



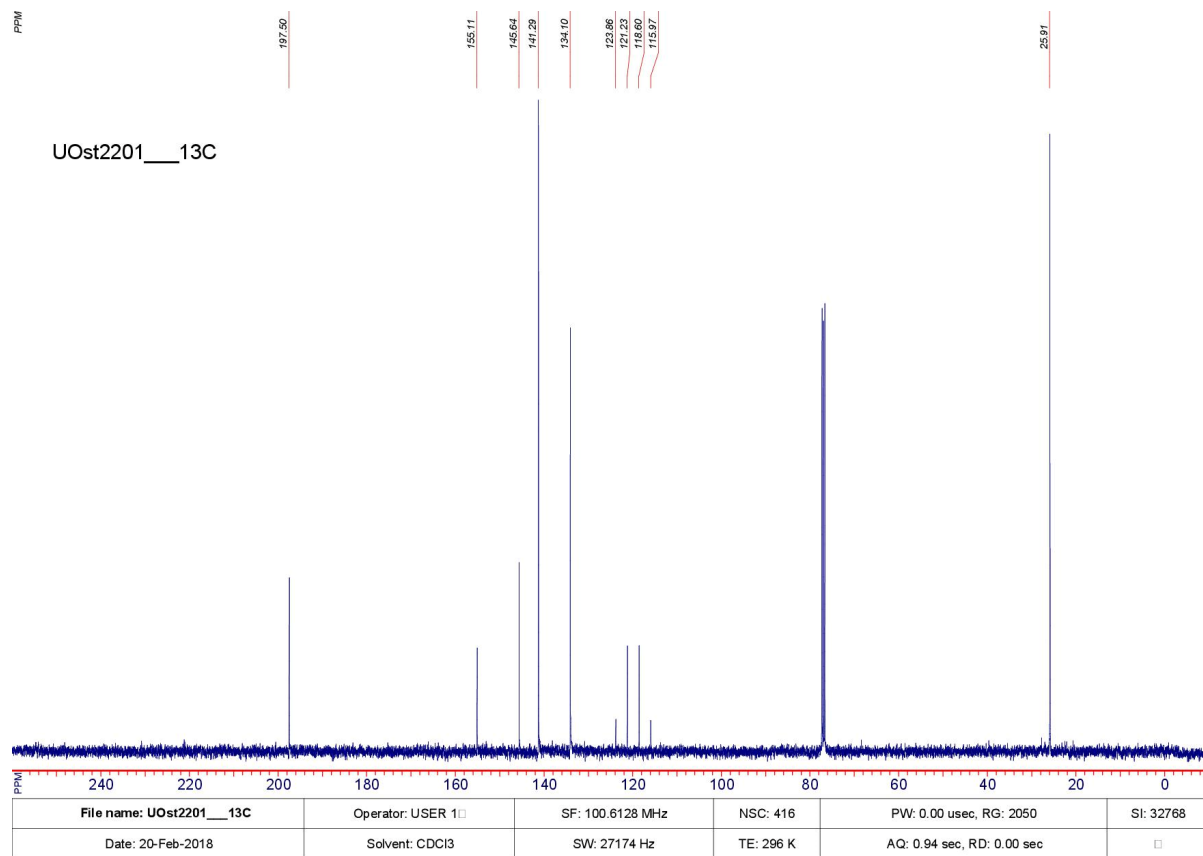
16.2. 2-Ethynyl-5-methoxypyrazine **18** (^{13}C NMR).



17.1. 1-(5-(trifluoromethoxy)pyrazin-2-yl)ethan-1-one **19** (^1H NMR).



17.2. 1-(5-(trifluoromethoxy)pyrazin-2-yl)ethan-1-one **19** (^{13}C NMR).



17.3. 1-(5-(trifluoromethoxy)pyrazin-2-yl)ethan-1-one **19** (^{19}F NMR).

