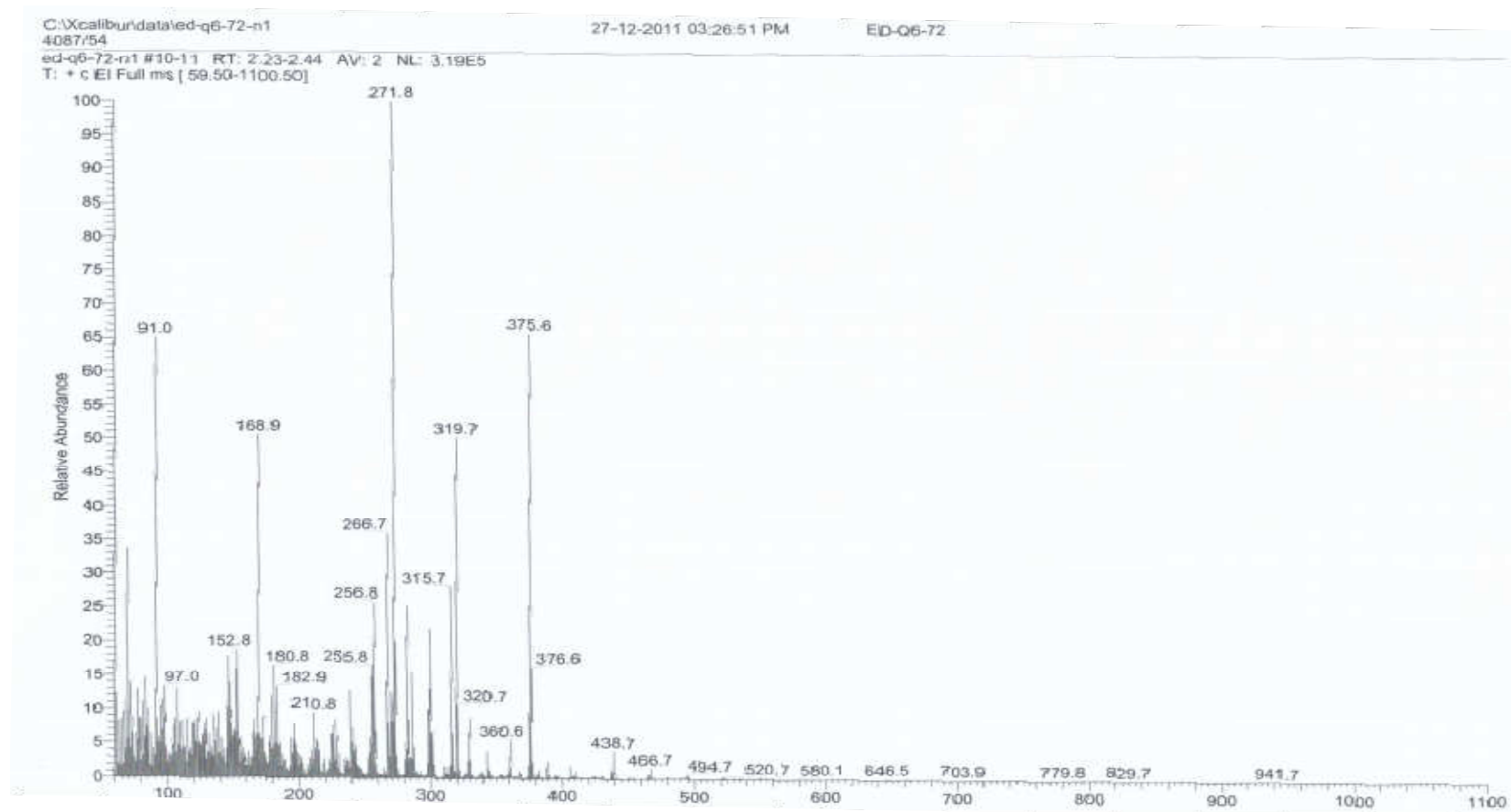
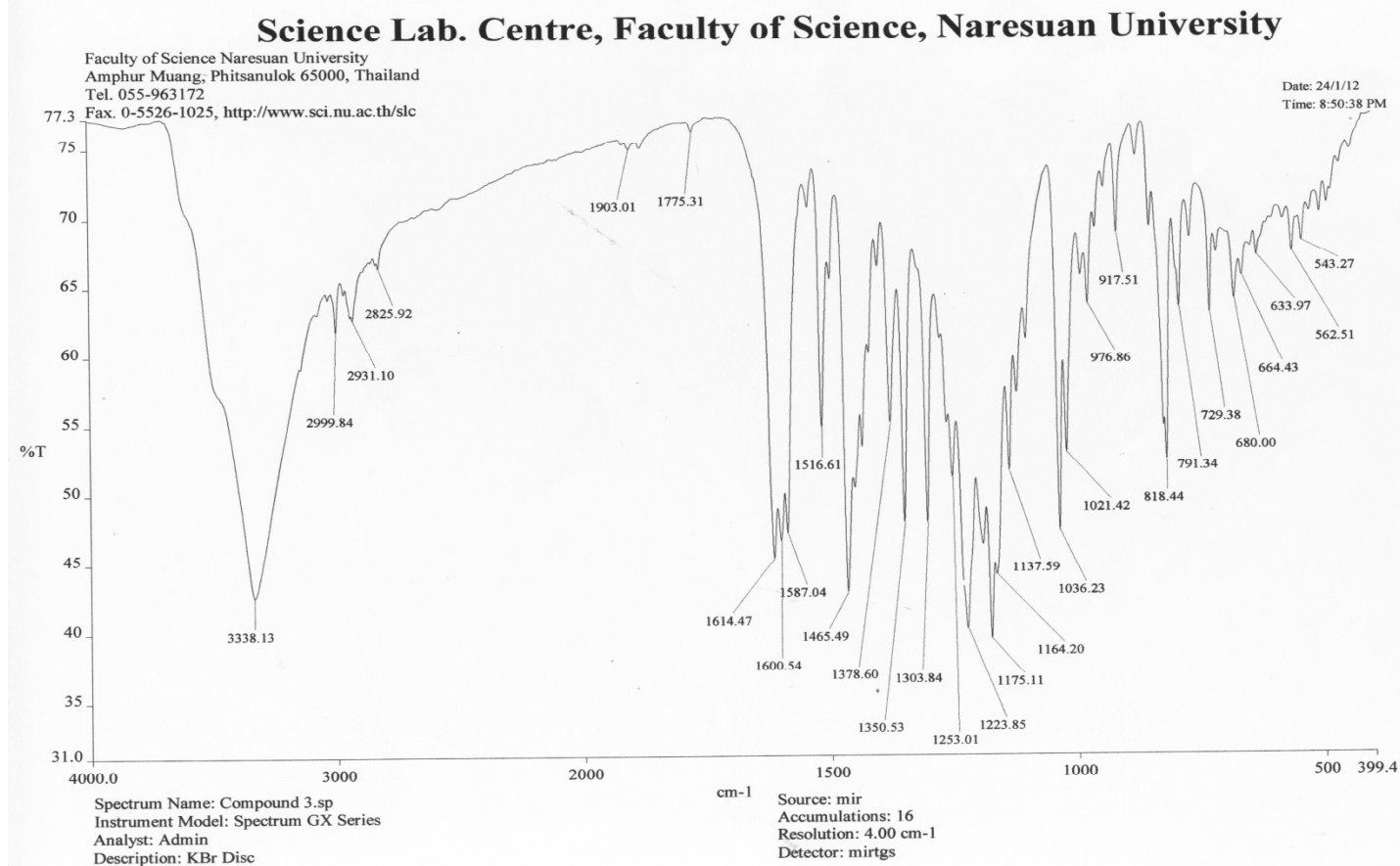


**APPENDIX C SPECTRAL DATA OF 1-(4'-hydroxybenzyl)-4,8-dimethoxyphenanthrene-2,7-diol (11)**



**Figure 53 EI-MS spectrum of 1-(4'-hydroxybenzyl)-4,8-dimethoxyphenanthrene-2,7-diol (11)**



**Figure 54 IR spectrum of 1-(4'-hydroxybenzyl)-4,8-dimethoxyphenanthrene-2,7-diol (11)**

20120117  
72/1 in DMSO 17/01/2012 (exp 1)

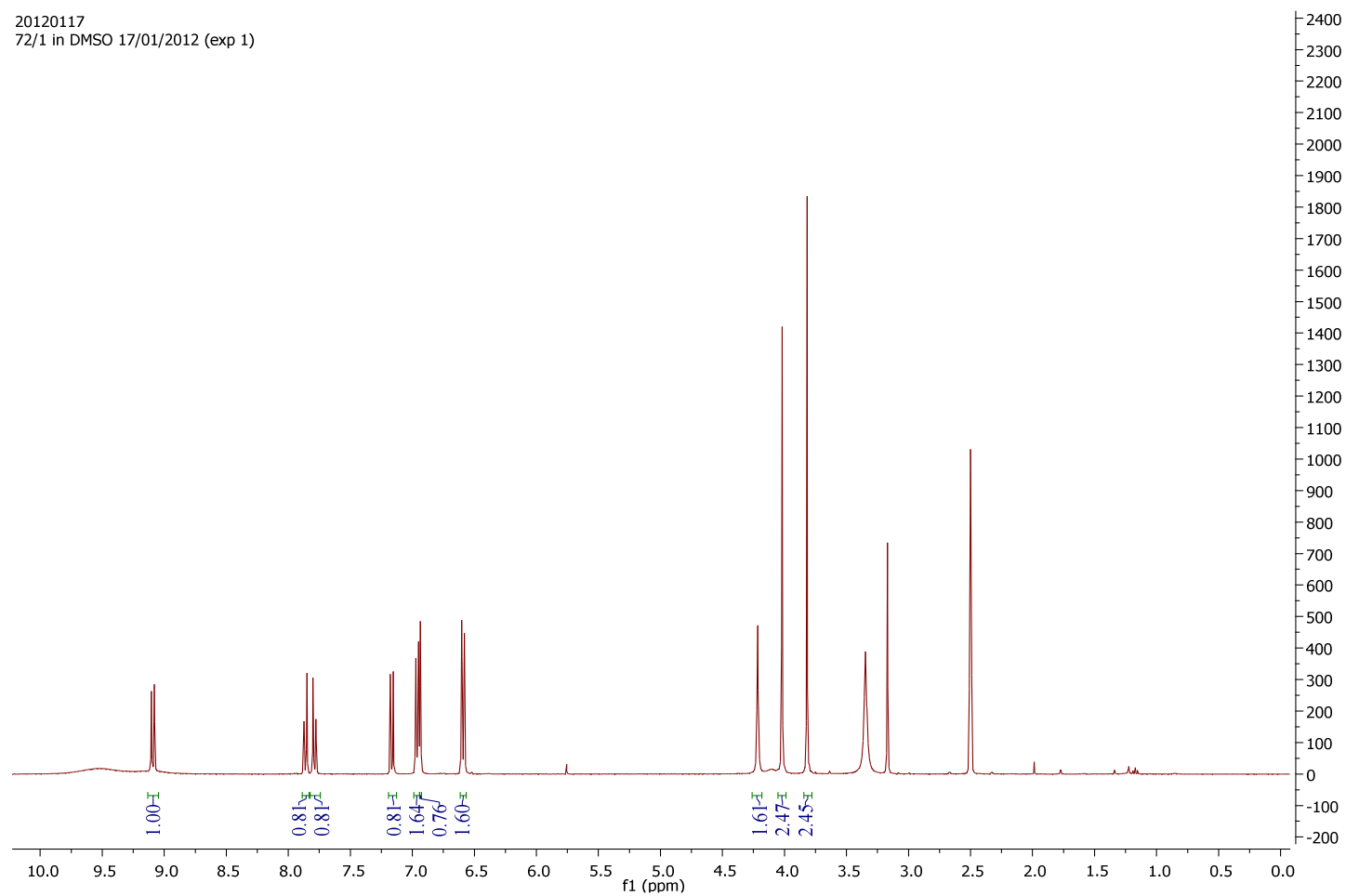
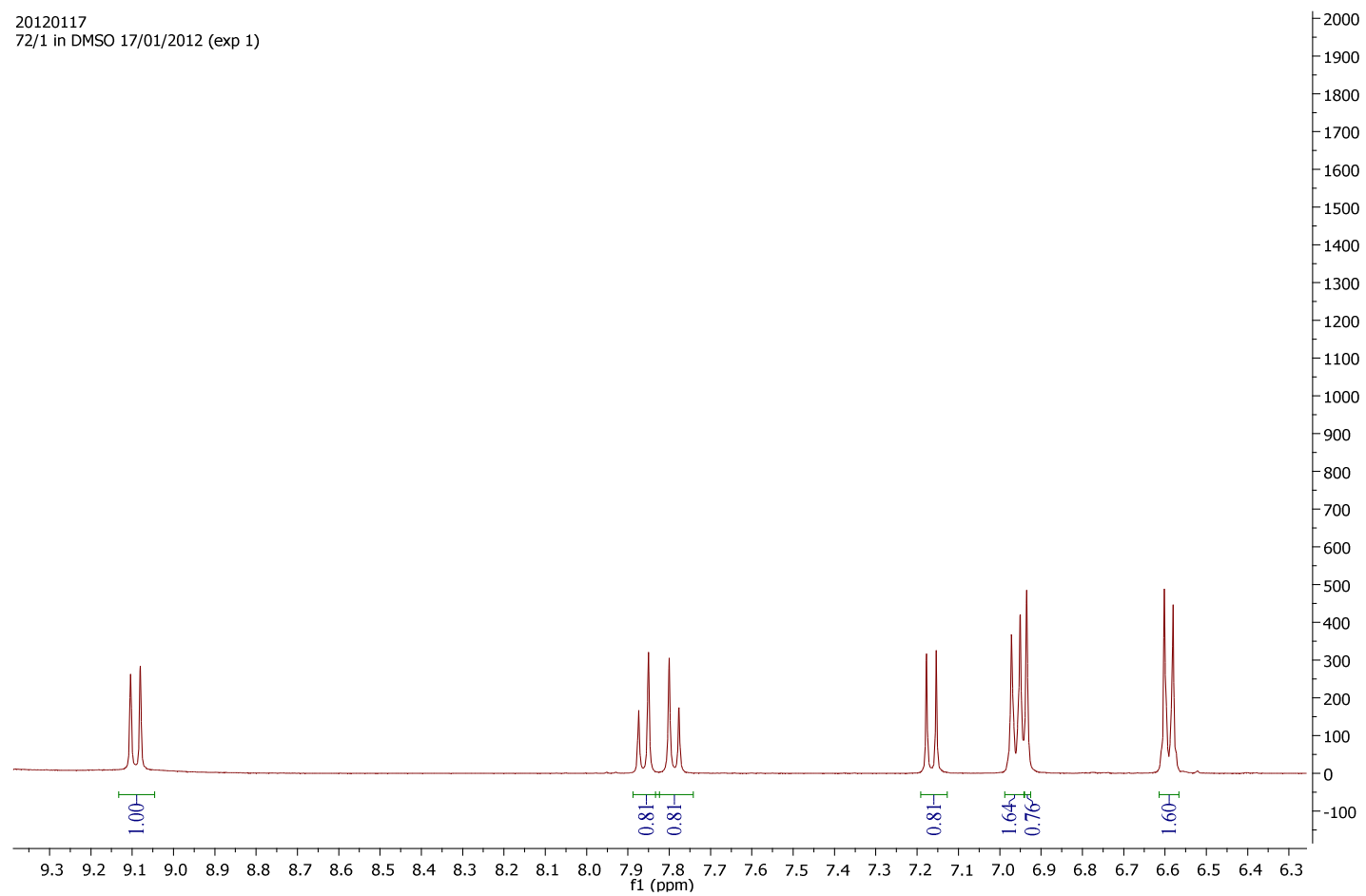


Figure 55  $^1\text{H}$ -NMR spectrum of 1-(4'-hydroxybenzyl)-4,8-dimethoxyphenanthrene-2,7-diol (11) (400 MHz, dimethylsulfoxide- $d_6$ )

20120117  
72/1 in DMSO 17/01/2012 (exp 1)



**Figure 56 Enlarged  $^1\text{H}$ -NMR spectrum of 1-(4'-hydroxybenzyl)-4,8-dimethoxyphenanthrene-2,7-diol (11) (6.3-9.3 ppm, 400 MHz, dimethylsulfoxide- $d_6$ )**

20120117  
13C 72/1 in DMSO 17/01/2012 (exp 3)

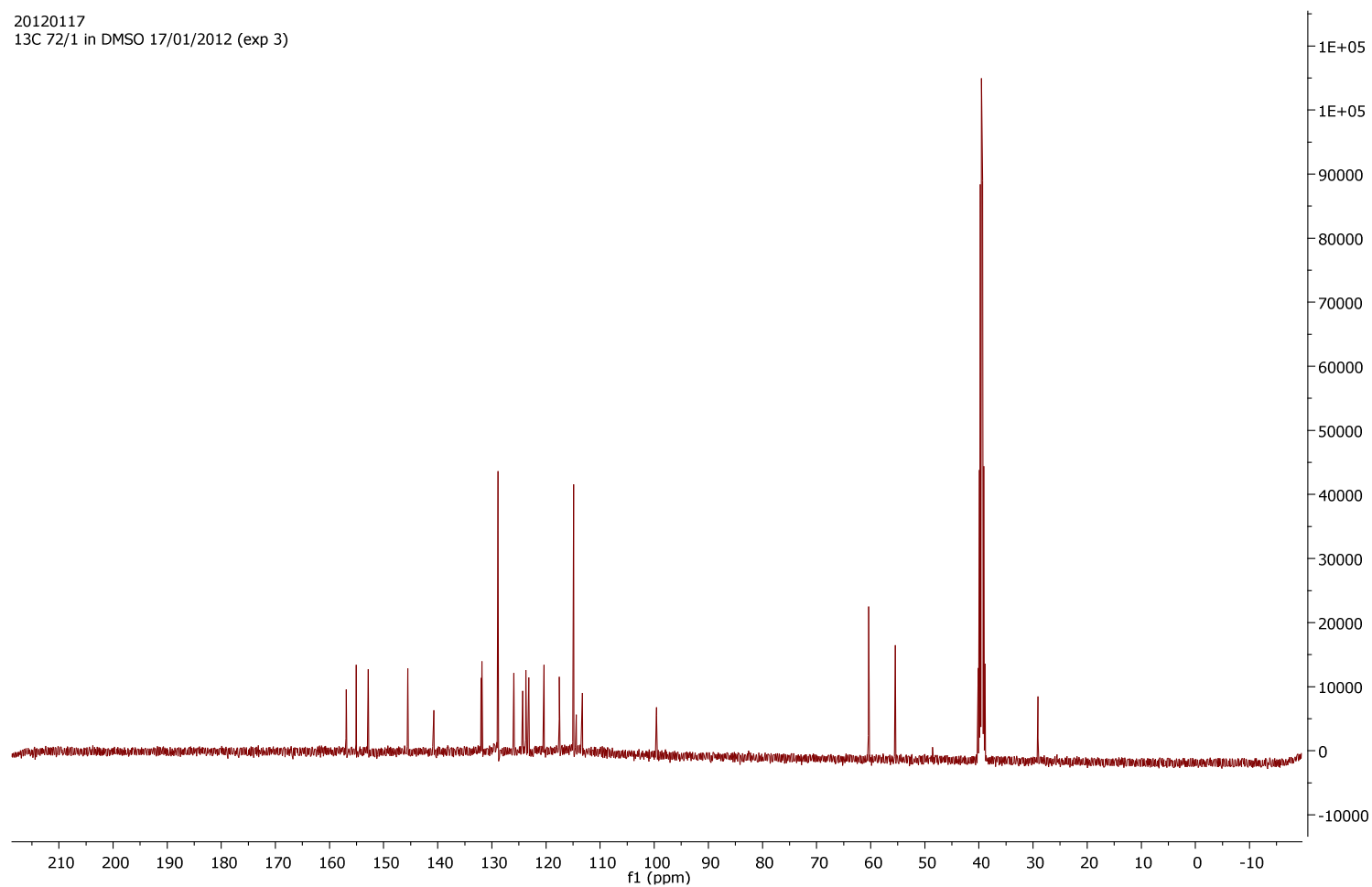
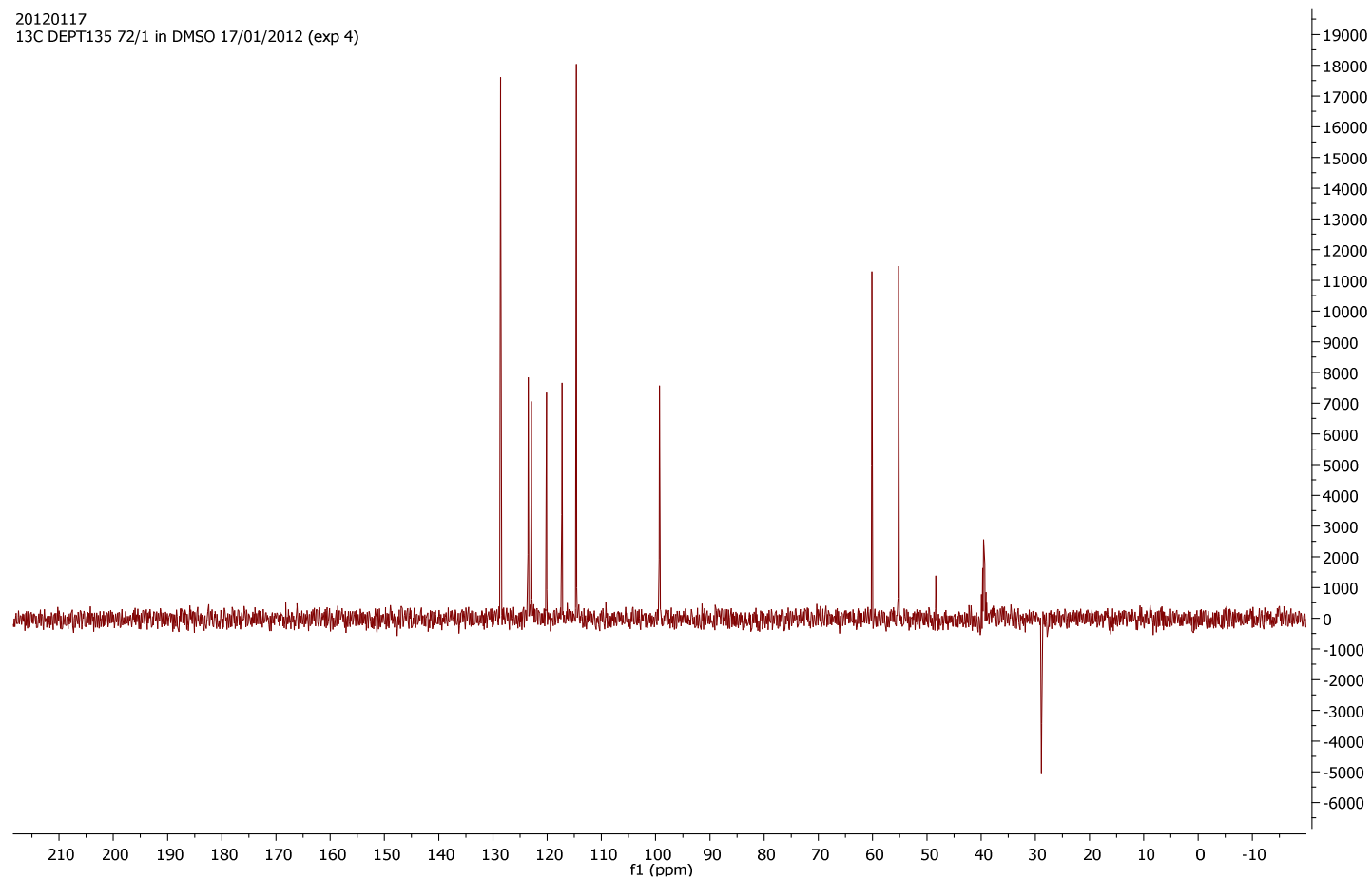
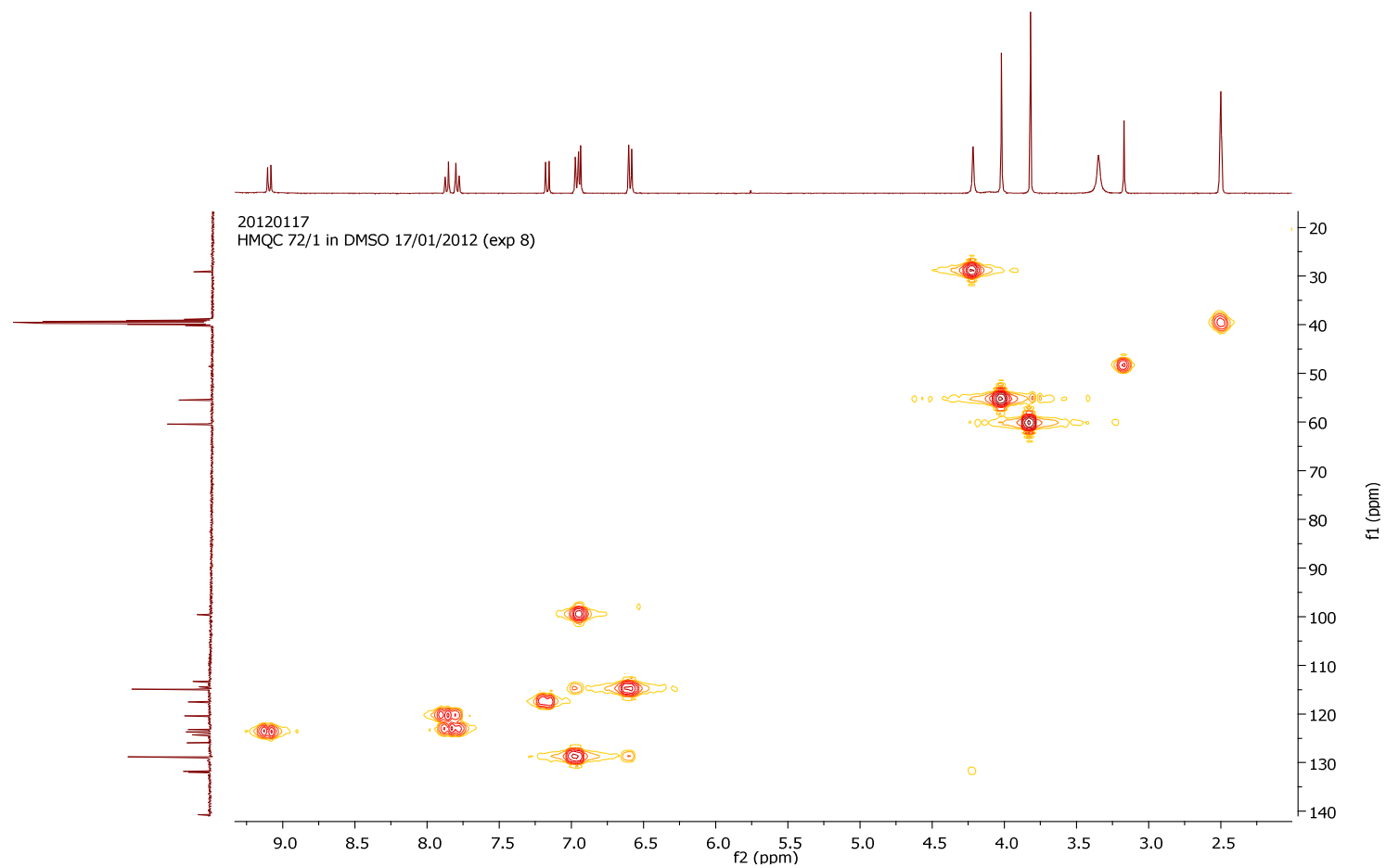


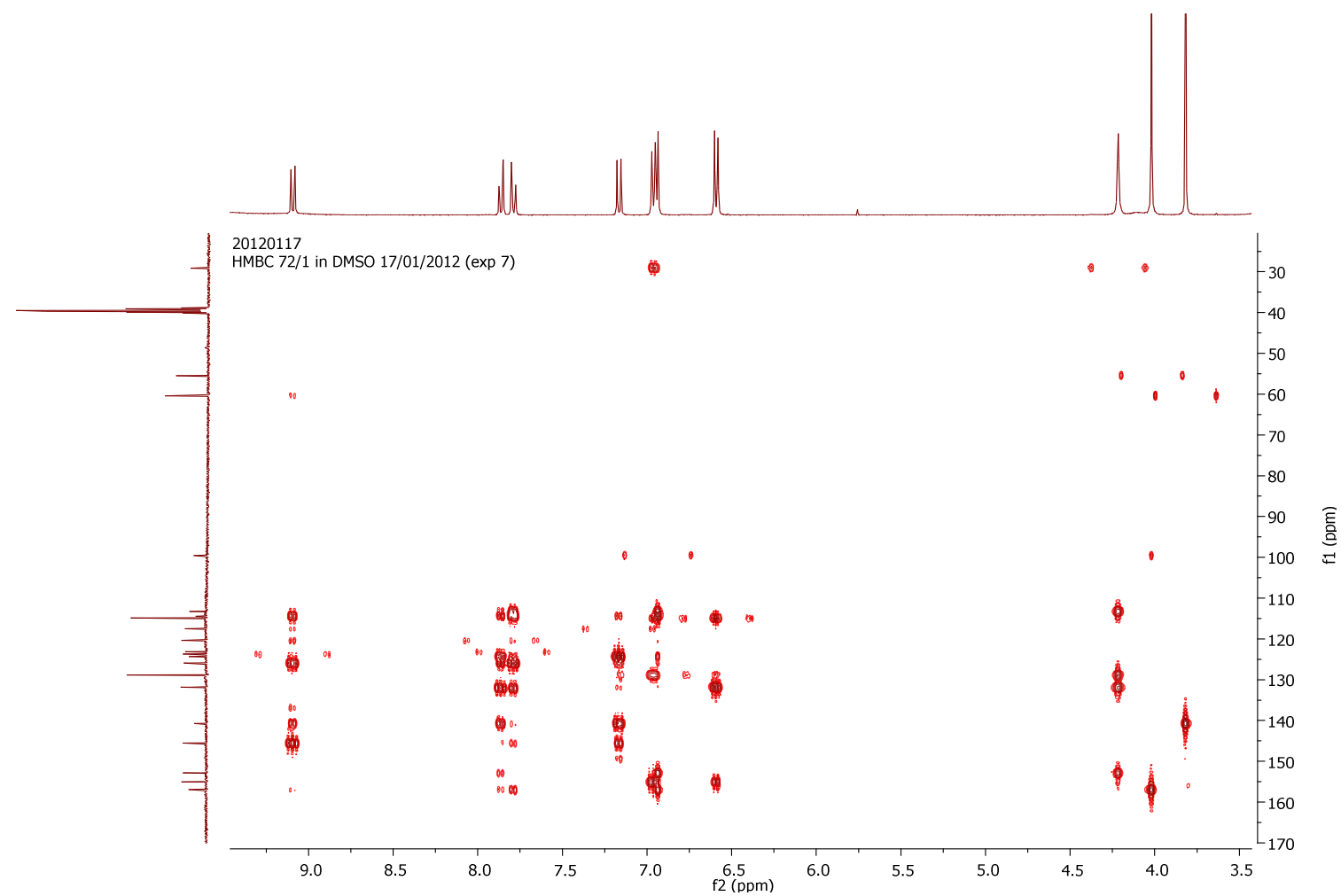
Figure 57  $^{13}\text{C}$ -NMR spectrum of 1-(4'-hydroxybenzyl)-4,8-dimethoxyphenanthrene-2,7-diol (11) (100 MHz, dimethylsulfoxide- $d_6$ )



**Figure 58 DEPT 135 spectrum of 11 1-(4'-hydroxybenzyl)-4,8-dimethoxyphenanthrene-2,7-diol (11) (100 MHz, dimethylsulfoxide- $d_6$ )**

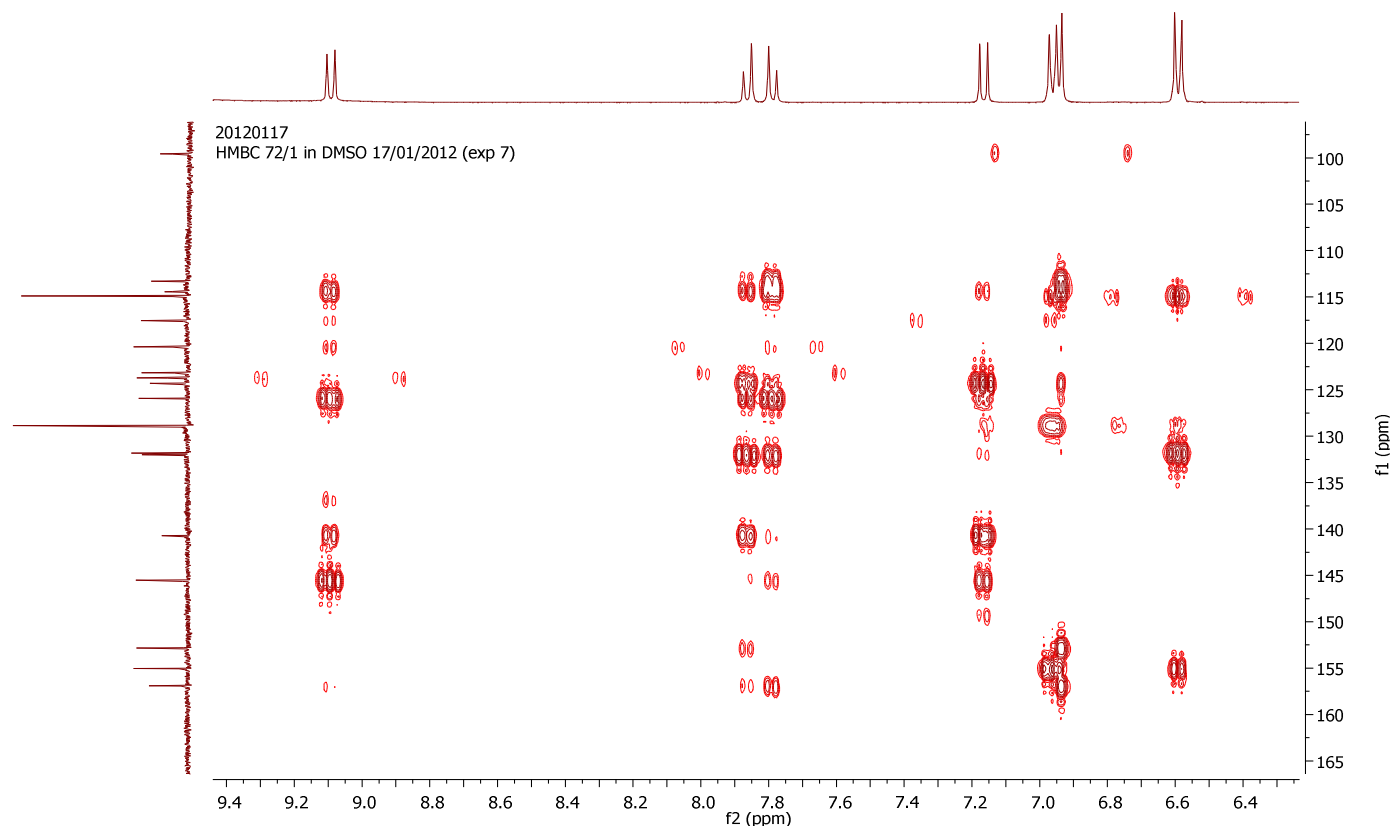


**Figure 59** HMQC spectrum of 1-(4'-hydroxybenzyl)-4,8-dimethoxyphenanthrene-2,7-diol (**11**) (400 MHz, dimethylsulfoxide- $d_6$ )

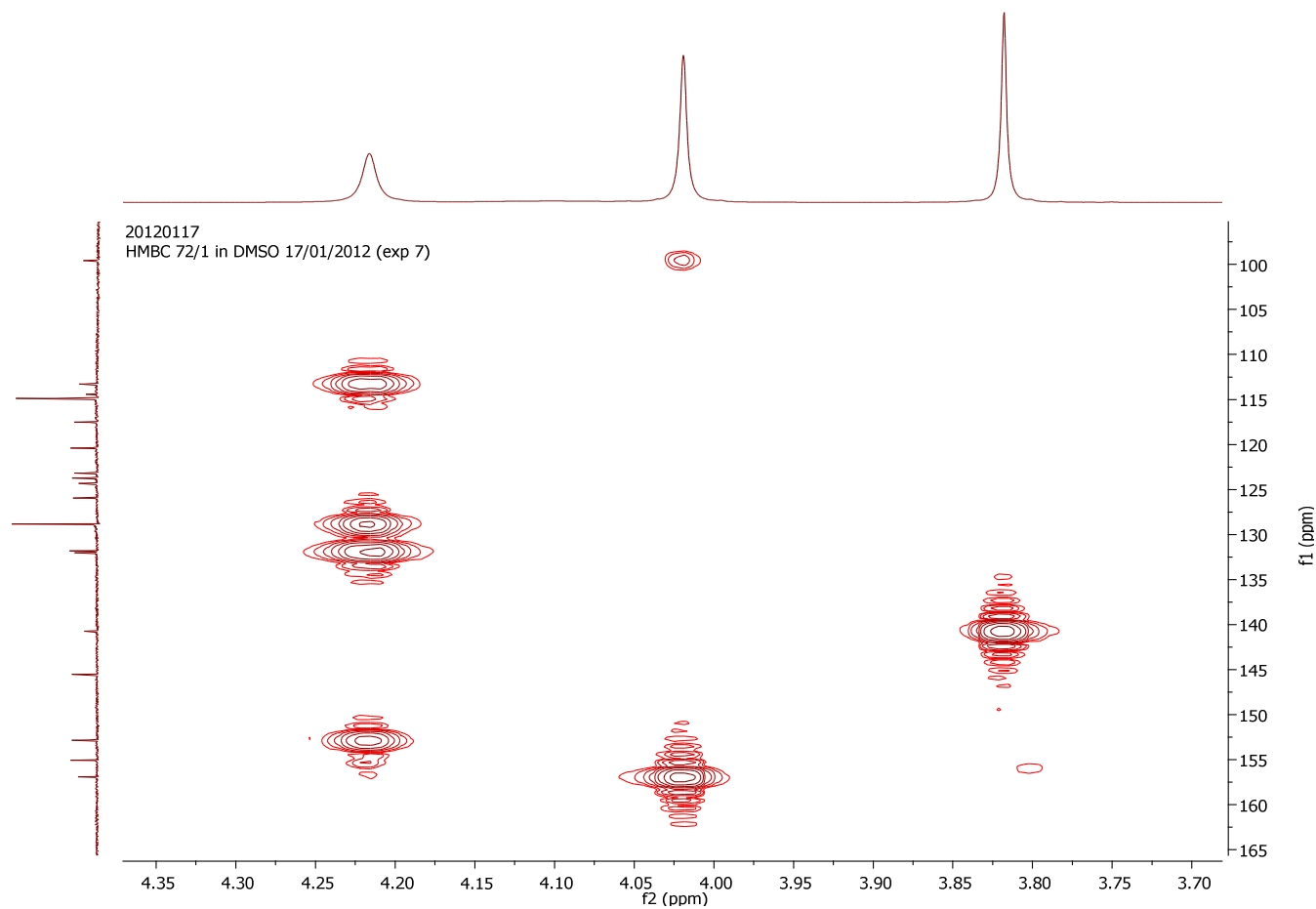


**Figure 60** HMBC spectrum of 1-(4'-hydroxybenzyl)-4,8-dimethoxyphenanthrene-2,7-diol (11) (400 MHz, dimethylsulfoxide- $d_6$ )

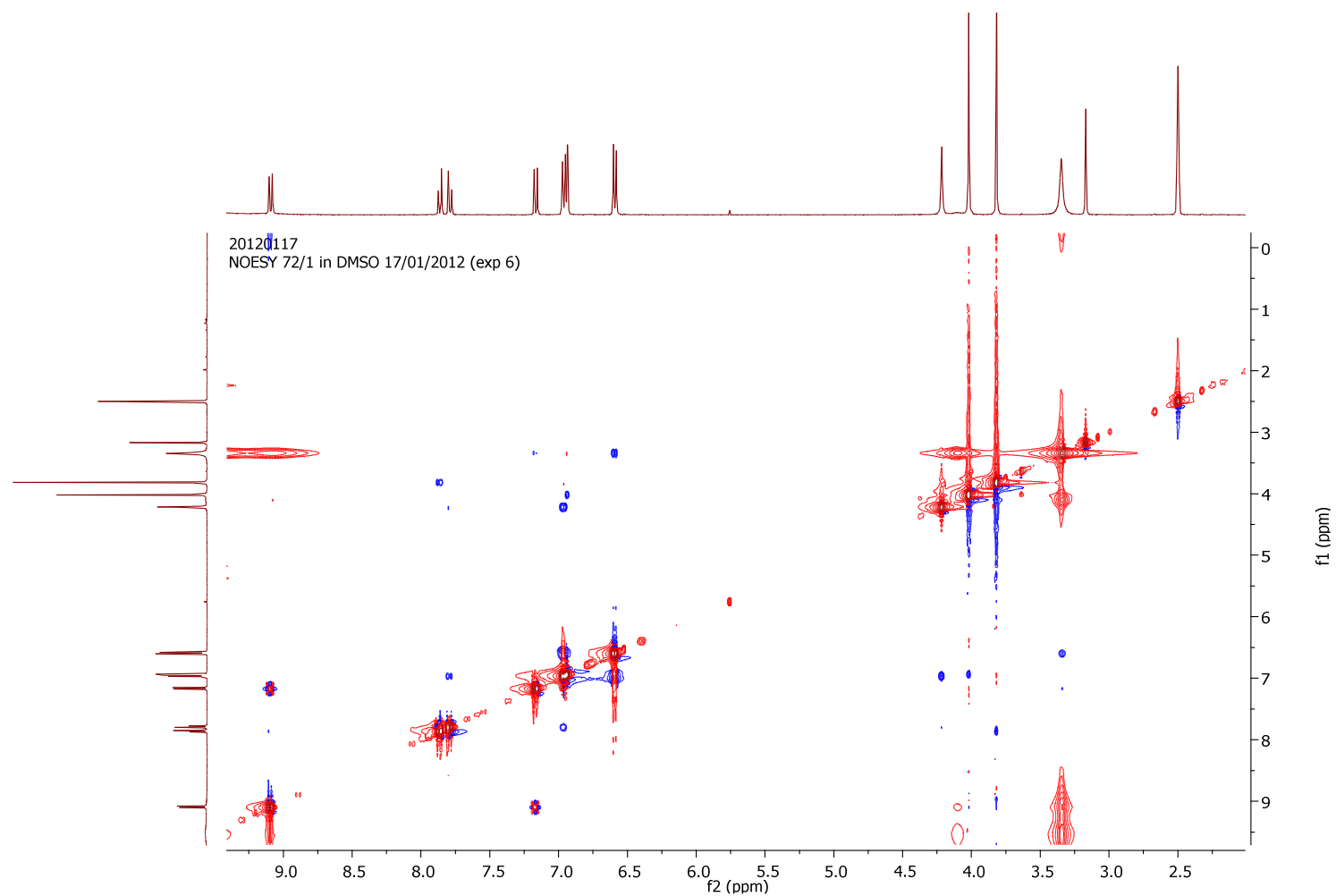




**Figure 61 Enlarge HMBC spectrum of 1-(4'-hydroxybenzyl)-4,8-dimethoxyphenanthrene-2,7-diol (11) (400 MHz, dimethylsulfoxide- $d_6$ ) (6.4-9.4 ppm versus 100-165 ppm)**



**Figure 62 Enlarge HMBC spectrum of 1-(4'-hydroxybenzyl)-4,8-dimethoxyphenanthrene-2,7-diol (11) (400 MHz, dimethylsulfoxide-*d*<sub>6</sub>) (3.70-4.35 ppm versus 100-165 ppm)**



**Figure 63** NOESY spectrum of 1-(4'-hydroxybenzyl)-4,8-dimethoxyphenanthrene-2,7-diol (**11**) (400 MHz, dimethylsulfoxide- $d_6$ )