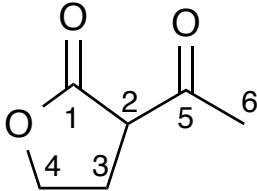


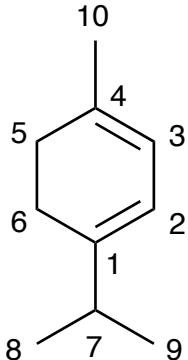
Chem 4010/5326: Organic Spectroscopic Analysis
Fall 2015
Problem Set 5

Answers to assigned problems from Simpson book.

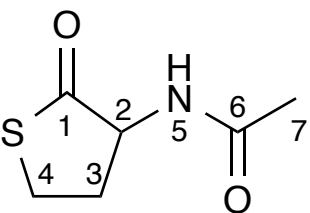
11.1

	¹ H NMR	¹³ C NMR
	C1: --	C1: 172.8
	C2: 3.60	C2: 52.5
	C3: 2.50, 2.15	C3: 23.6
	C4: 4.20–4.08	C4: 67.0
	C5: --	C5: 200.5
	C6: 2.20	C6: 29.0

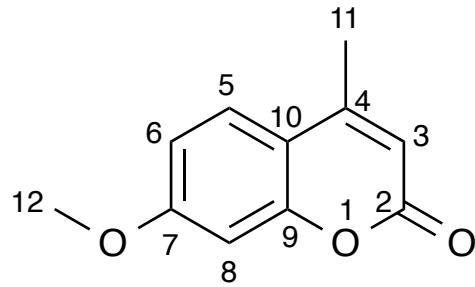
11.2

	¹ H NMR	¹³ C NMR
	C1: --	C1: 142.7
	C2: 5.60	C2: 116.6
	C3: 5.65	C3: 119.7
	C4: --	C4: 133.4
	C5: 2.20–2.05	C5: 29.2
	C6: 2.20–2.05	C6: 25.5
	C7: 2.30	C7: 34.7
	C8: 1.05	C8: 21.4
	C9: 1.05	C9: 21.4
C10: 1.80	C10: 23.1	

11.5

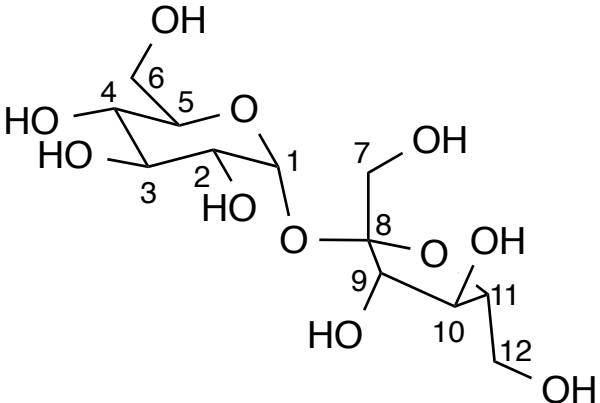
	¹ H NMR	¹³ C NMR
	C1: --	C1: 205.9
	C2: 4.55	C2: 59.6
	C3: 2.88/1.93	C3: 23.0
	C4: 3.23/3.45	C4: 27.7
	N5: 6.30	N5: --
	C6: --	C6: 170.9
C7: 2.13	C7: 23.2	

11.9

	¹ H NMR	¹³ C NMR
	O1: --	O1: --
	C2: --	C2: 161.3
	C3: 6.12	C3: 112.0
	C4: --	C4: 113.6
	C5: 7.49	C5: 125.6
	C6: 6.88	C6: 112.3
	C7: --	C7: 162.7
C8: 6.80	C8: 100.9	

	C9: --	C9: 155.3
	C10: --	C10: 152.6
	C11: 2.40	C11: 18.7
	C12: 3.88	C12: 55.8

11.10

	¹ H NMR	¹³ C NMR
	C1: 5.23	C1: 92.3
C2: 3.38	C2: 71.1	
C3: 3.58	C3: 72.6	
C4: 3.29	C4: 69.3	
C5: 3.67	C5: 72.5	
C6: 3.65	C6: 60.2	
C7: 3.49	C7: 61.4	
C8: --	C8: 103.8	
C9: 4.03	C9: 76.4	
C10: 3.87	C10: 74.0	
C11: 3.71	C11: 81.5	
C12: 3.65	C12: 62.4	