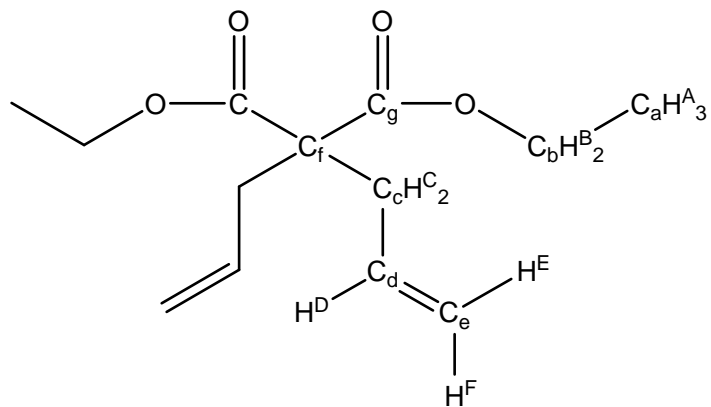


Problem V Answers

¹H nmr

Shift (ppm), multiplicity	Coupling Constant (Hz)	Integration		COSY shows strongest correlation to protons at δ (ppm)	Assignment	Reference Values	
		Actual	Relative			Predicted (manual)	SDBS ¹ or Aldrich ²
7.24 s	-	-	-	-	CHCl ₃ in CDCl ₃	7.24	-
~5.58 m	-	0.10	1	~5.04 E/F, 2.58 C (⁴ J)	D	5.25+0.45(gem-alkyl)=5.7	5.64 ¹
5.05 d	³ J _{ED} = 16	0.20	2	5.58 D, 2.58 C	E	5.25-0.22(cis-alkyl)=5.03	5.12 ¹
5.04 d	³ J _{FD} = 12				F	5.25-0.28(trans-alkyl)=4.97	5.10 ¹
4.13 q	³ J _{BA} = 7	0.19	2	1.19 A	B	4.1 (CH ₂ -O-CO-R)	4.180 ¹
2.58 d	³ J _{CD} = 7	0.20	2	5.58 D, ~5.04 E/F (⁴ J)	C	2.3 (CH ₂ -C=C)	2.638 ¹
1.19 t	³ J _{AB} = 7	0.29	3	4.13 B	A	1.3 (CH ₃ -C-O)	1.248 ¹



¹³C nmr

Shift (ppm)	DEPT-135		Hetcor shows correlation to protons at δ (ppm)	Assignment	Reference Values	
	signal	inference			Predicted (manual)	SDBS ¹ or Aldrich ²
170.7	x	C	-	g	160-177 (R-CO-OR)	170.73 ¹
132.3	↑	CH/CH ₃	5.58 D	d	138-150 (<u>CH</u> =CH ₂ β)	132.51 ¹
119.0	↓	CH ₂	~5.04 E,F	e	106-117 (=CH ₂ α)	119.10 ¹
77.1	x	C	-	CDCl ₃	77.16	-
61.2	↓	CH ₂	4.13 B	b	60.4 (CH ₂ -O-CO-R)	61.25 ¹
57.2	x	C	-	f	27.7(>C<)+2[11(C-CO-O-R)]+2[5.3(C-C-C=C)]=60.3	57.37 ¹
36.7	↓	CH ₂	2.58 C	c	27-36 (CH ₂ -C=C)	36.91 ¹
14.1	↑	CH/CH ₃	1.19 A	a	14-16 (CH ₃ -C-O)	14.18 ¹

