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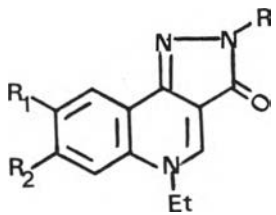
APPENDICES

Table 1 : Physicochemical Properties of Pyrazoloquinolones Derivatives.



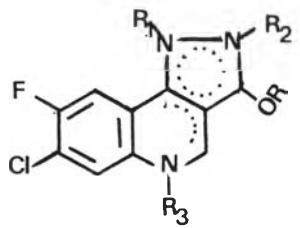
Compound	Apparance	mp(°C)	% yield	Formular	MW
I. 5-Ethyl -2-arylpyrazolo [4,3-c] quinolin-3-one ($R=C_6H_5, R_1, R_2=H$)	yellow needles	> 300	41	$C_{18}H_{15}N_3O$	289
II. 7-Chloro-5-ethyl-8-fluoro -2-arylpyrazolo [4,3-c] quinolin-3-one ($R=C_6H_5, R_1=F, R_2=Cl$)	yellow needles	285-286	83	$C_{18}H_{13}N_3OClF$	341
III. 7-Chloro-5-ethyl-8-fluoro -2H-pyrazolo [4,3-c] quinolin-3-one ($R=H, R_1=F, R_2=Cl$)	yellow needles	273-275	52	$C_{12}H_9N_3OClF$	265

Table 2 : Spectroscopic Properties of N—Ethyl—Pyrazoloquinolone Derivatives.

Compound	^{1}H-NMR (a) coupling constant(Hz)						$IR_{(b)}(cm^{-1})$	Mass spectra
	H-4	H-6	H-9	J_{6-8}(H-F)	J_{8-9}(H-F)	other signals		m/e
IIIa	8.70	8.17	8.01	6.4	11.2	1.43 (t,CH_3), 4.50 (q,CH_2), 11.54 (b,NH)	2860-3138 (C-H), 1628 (C=O,amide), 1503 (C=C), 1465 (C-H,bending), 1379 (C-N)	265
IIIb	9.04	8.31	8.36	6.6	9.1	1.42 (t,CH_3), 4.61 (q,CH_2)	2893-2907 (C-H), 1636 (C=O,amide), 1591 (C=C), 1437 (C-H,bending), 1345 (C-N)	265
IIIc	8.76	8.18	8.03	6.4	9.3	1.24 (t,CH_3), 1.35 (t,CH_3), 3.90 (q,CH_2), 4.47 (q,CH_2)	2806-3105 (C-H), 1644 (C=O,amide), 1463 (C-H,bending), 1369 (C-N)	293
IIId	8.94	8.27	8.30	6.4	9.3	1.40 (m,2-CH_3), 4.42 (q,CH_2), 4.65 (q,CH_2)	2890-3113 (C-H) 1616 (C=N), 1576 (C=C), 1467 (C-H,bending), 1348 (C-N)	293

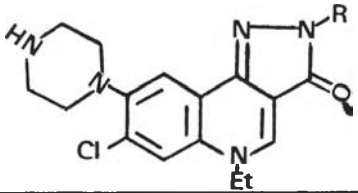
(a) Chemical shift is δ ; solvent dimethylsulfoxide-d_6
(b) Taken in potassium bromide pellets
IIIa = 7-chloro-5-ethyl-8-fluoro-2H-pyrazolo [4,3-c] quinolin-3-one
IIIb = 7-chloro-1-ethyl-8-fluoro-2H-pyrazolo [4,3-c] quinolin-3-one
IIIc = 7-chloro-2,5-diethyl-8-fluoro-pyrazolo [4,3-c] quinolin-3-one
IIId = 7-chloro-3-ethoxy-1-ethyl-8-fluoro-2H-pyrazolo [4,3-c] quinoline

Table 3 : Physicochemical Properties of N-Ethyl-Pyrazoloquinolone Derivatives.



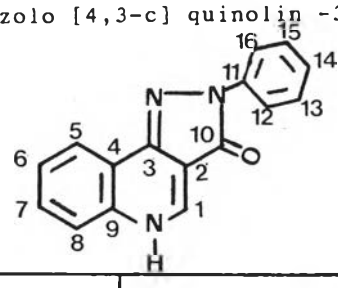
Compound	Apparance	mp(°C)	Formular	MW
IIIa. 7-Chloro-5-ethyl -8-fluoro -2H-pyrazolo [4,3-c] quinolin -3-one (R_2=H;R_3=C_2H_5)	yellow crystal	241	$C_{12}H_9N_3OClF$	265
IIIb. 7-Chloro-1-ethyl-8-fluoro -2H-pyrazolo [4,3-c] quinolin-3-one (R_1=C_2H_5;R_2=H)	pale yellow crystal	>300	$C_{12}H_9N_3OClF$	265
IIIc. 7-Chloro-2,5-diethyl-8-fluoro -pyrazolo [4,3-c] quinolin-3-one (R_2,R_3=C_2H_5)	yellow crystal	245	$C_{14}H_{13}N_3OClF$	293
IIId. 7-Chloro-3-ethoxy-1-ethyl -8-fluoro-2H-pyrazolo [4,3-c] quinoline (R_1,R_3=C_2H_5)	white crystal	143	$C_{14}H_{13}N_3OClF$	293

Table 4 : Physicochemical Properties of 8-(1-piperazinyl) Pyrazoloquinolones Derivatives.



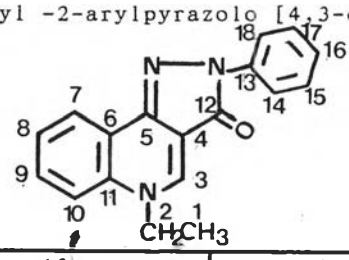
Compound	Apparance	mp(°C)	% yield	Formular	MW
5-Ethyl-7-chloro-8-(1-piperazinyl)-2-arylpyrazolo [4,3-c] quinolin-3-one ($R=C_6H_5$)	yellow solid	242 (dec.)	47	$C_{22}H_{22}N_5OCl$	407
5-Ethyl-7-chloro-8-(1-piperazinyl)-2H-pyrazolo [4,3-c] quinolin-3-one (R=H)	yellow solid	254 (dec.)	43	$C_{16}H_{18}N_5OCl$	331

Table 5 : Assignment of ^{13}C-NMR and ^{1}H-NMR Chemical shift of 2-Arylpyrazolo [4,3-c] quinolin -3-one.



Position	^{13}C(ppm)		^{1}H (ppm)	
	Dept-135	normal	DMSO-d_6+$CDCl_3$	DMSO-d_6
1	139.41		8.27 (singlet,1H)	8.32 (doublet,1H)
2	-	106.23	-	-
3	-	143.07	-	-
4	-	135.56	-	-
5	130.24	-	7.58-7.77	7.42-7.60
6	122.19	-	(multiplet,3H)	(multiplet)
7	126.52	-		
8	124.05	-	8.21 (doublet,1H)	8.22 (doublet,1H)
9	-	140.15	-	-
10	-	161.70	-	-
11	-	143.07	-	-
12	118.75	-	8.21 (doublet,1H)	8.17 (doublet,1H)
13	128.73	-	7.43 (triplet,1H)	7.35 (triplet,1H)
14	119.60	-	7.18 (triplet,1H)	7.17 (triplet,1H)
15	128.73	-	7.43 (triplet,1H)	7.35 (triplet,1H)
16	118.75	-	8.21 (doublet,1H)	8.17 (doublet,1H)
17	-	-	12.84 (broad,1H)	12.46 (broad,1H)

Table 6 : Assignment of ^{13}C-NMR and ^{1}H-NMR Chemical shift of 5-Ethyl -2-arylpyrazolo [4,3-c] quinolin -3-one.



position	^{13}C-NMR (ppm)	^{1}H-NMR (ppm)
1	14.61	1.43 (triplet,3H)
2	48.77	4.51 (quartet,2H)
3	140.09	8.90 (singlet,1H)
4	106.35	-
5	143.45	-
6	135.33	-
7	130.59	7.94 (doublet,1H)
8	124.10	7.61 (triplet,1H)
9	126.61	7.76 (triplet,1H)
10	122.82	8.30 (doublet,1H)
11	142.73	-
12	161.70	-
13	143.45	-
14	118.71	8.20 (doublet,1H)
15	128.76	7.45 (triplet,1H)
16	119.94	7.09 (triplet,1H)
17	128.76	7.45 (triplet,1H)
18	118.05	8.20 (doublet,1H)

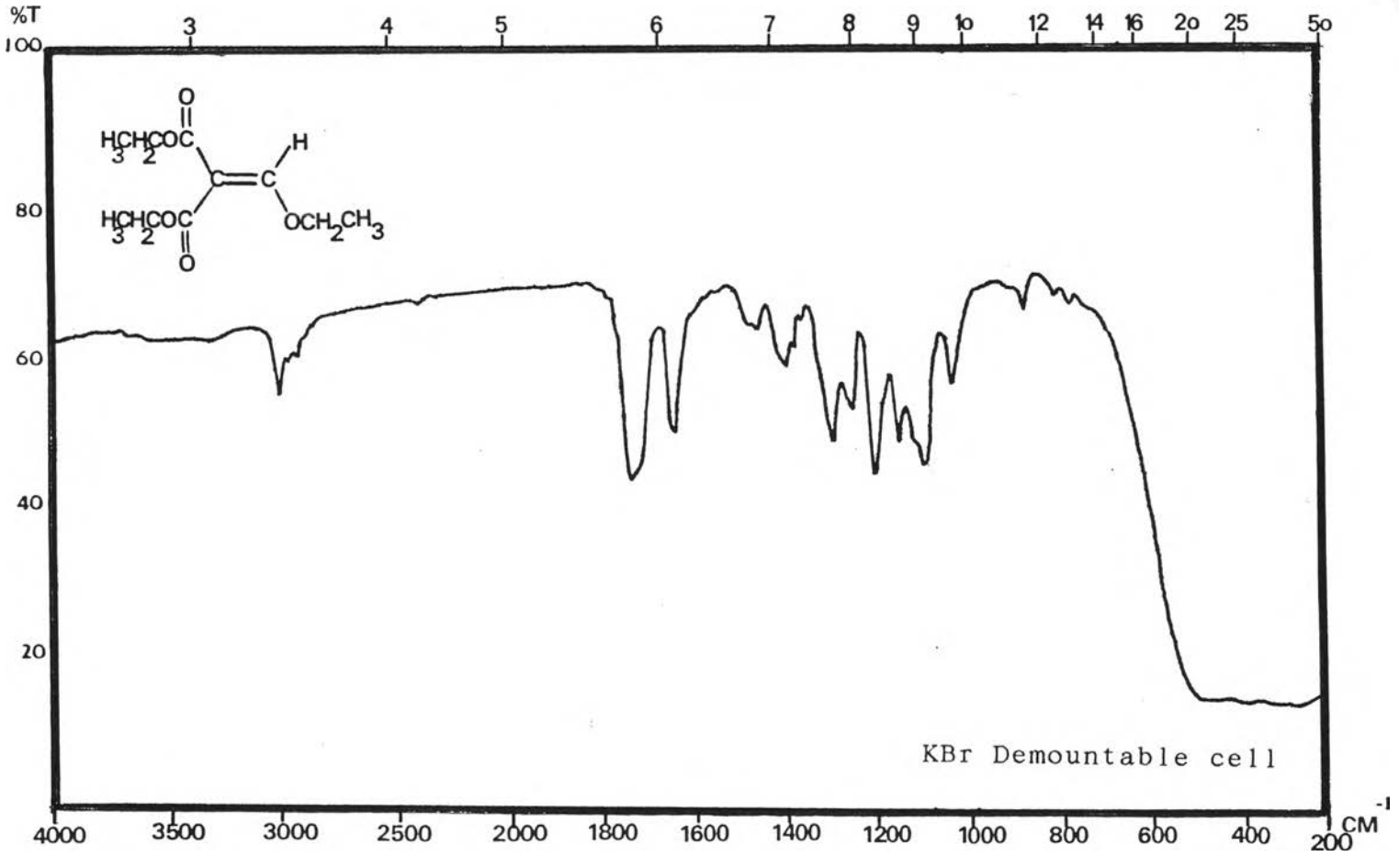


Figure 2 The IR spectrum of Diethyl ethoxymethylenemalonate.

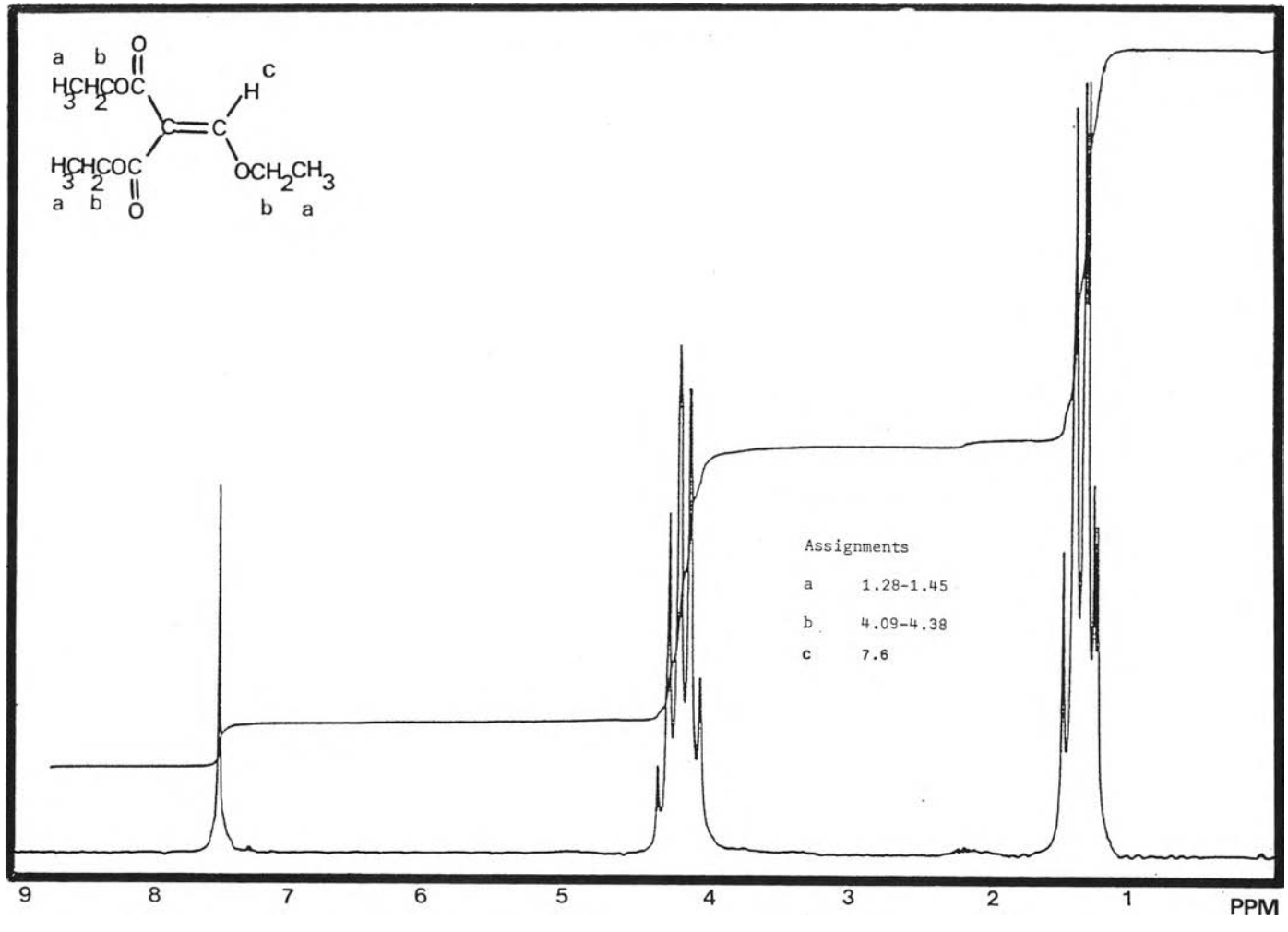


Figure 3 The ^{1}H-NMR spectrum of Diethyl ethoxy methylenemalonate in $CDCl_3$.

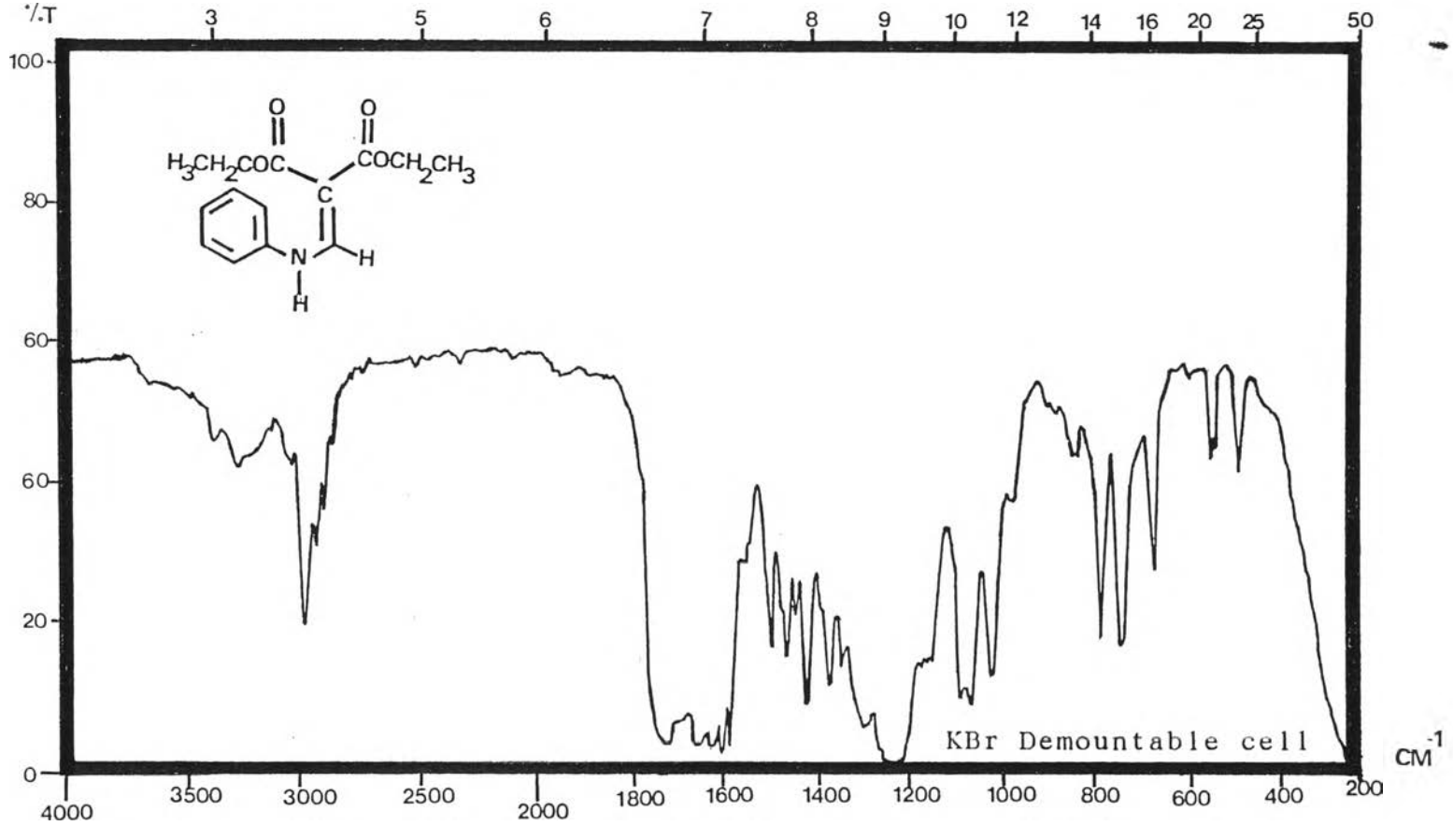


Figure 4 The IR spectrum of Ethyl anilinomethylenemalonate.

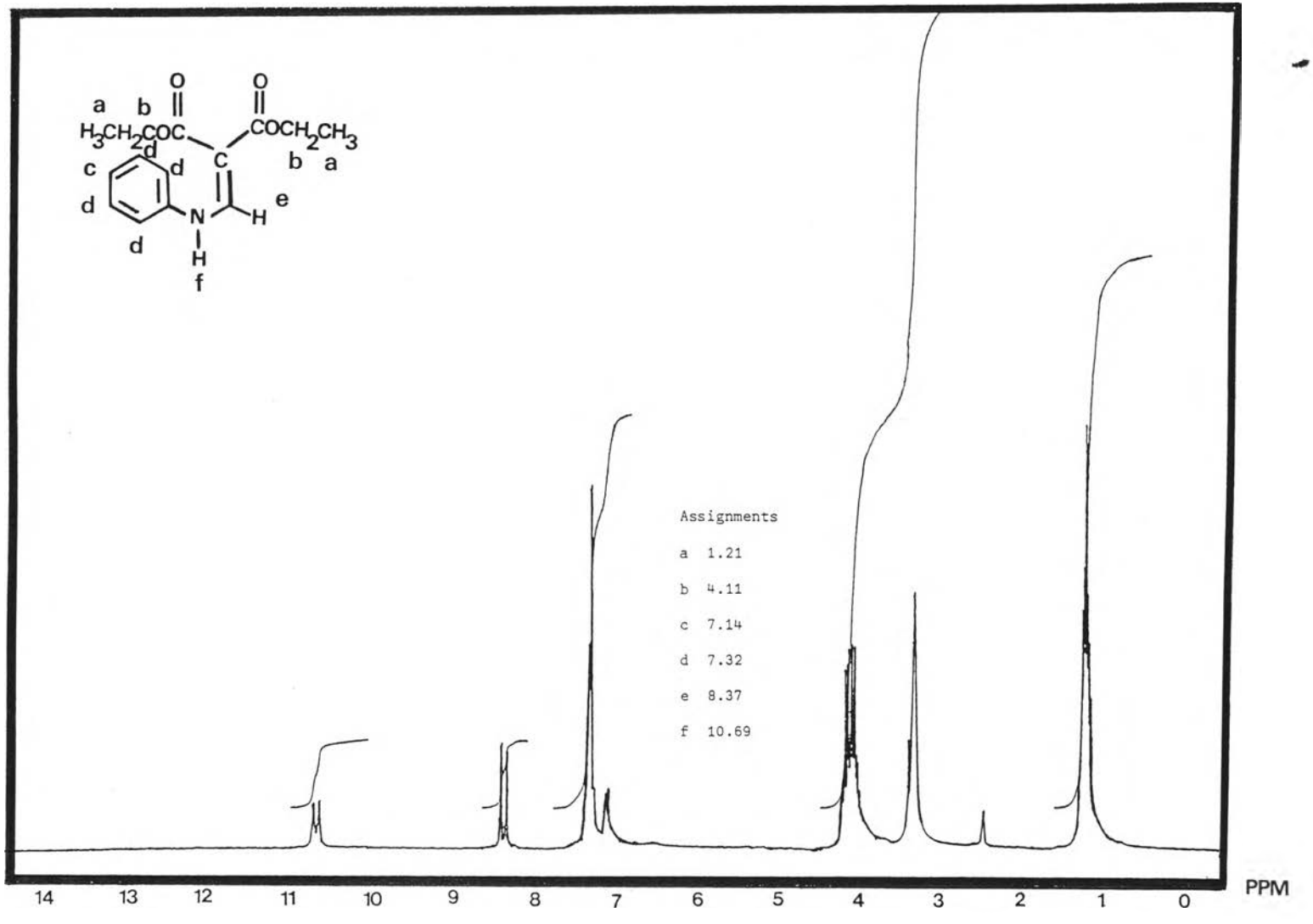


Figure 5 The ^{1}H-NMR spectrum of Ethyl anilino methylenemalonate in DMSO-d_6.

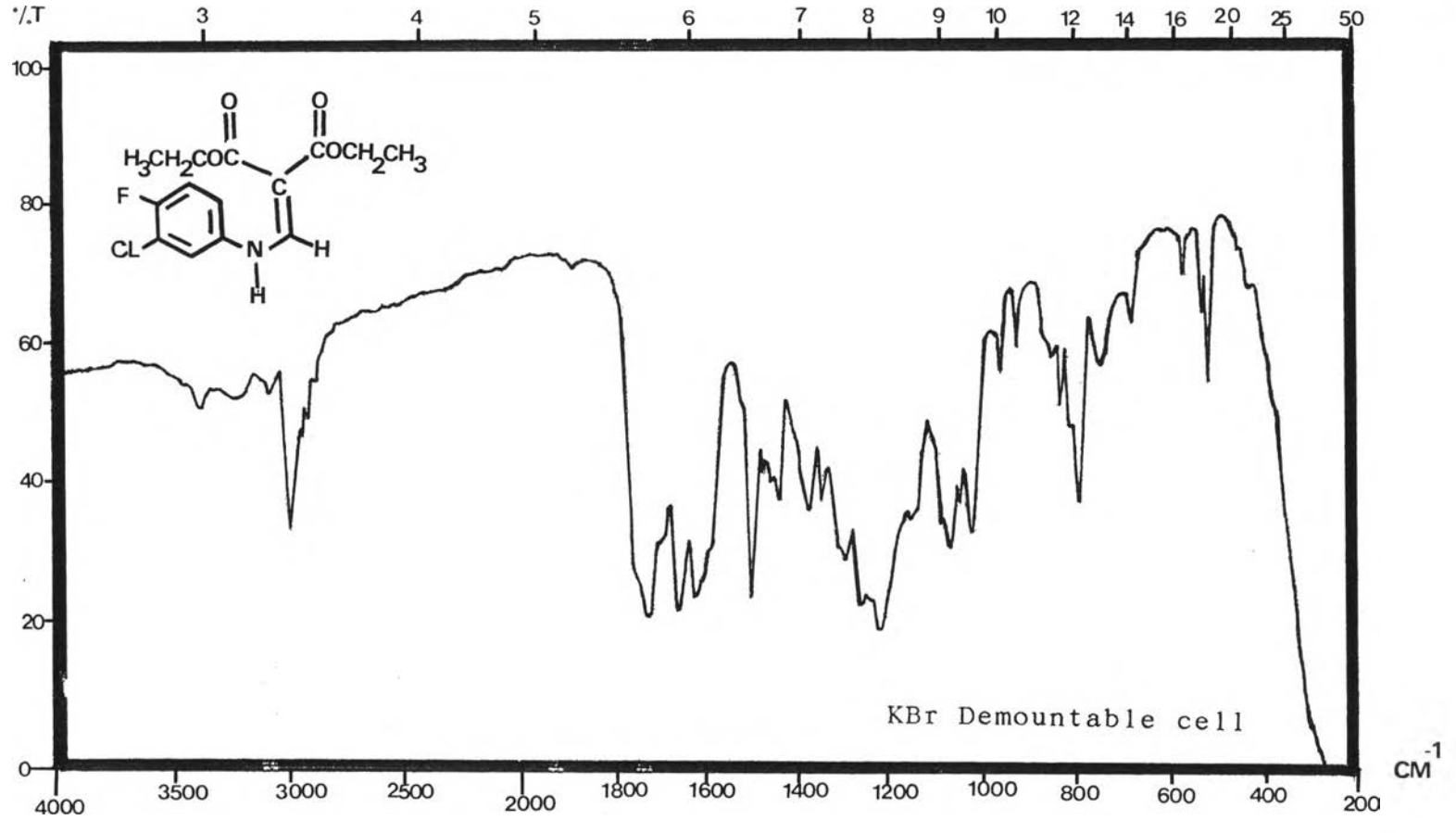


Figure 6 The IR spectrum of Ethyl anilino(3-chloro-4-fluoro) methylenemalonate.

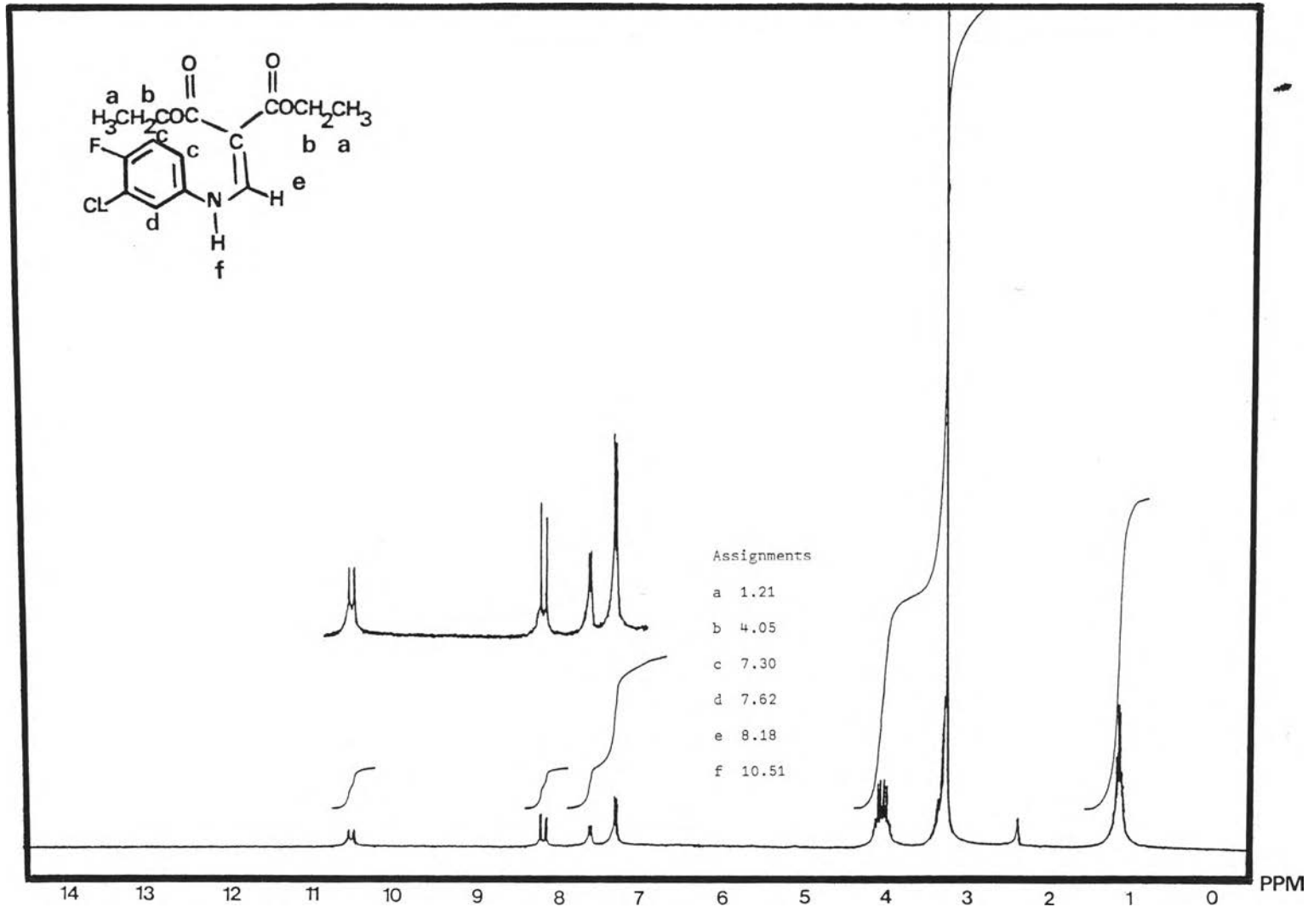


Figure 7 The ^{1}H-NMR spectrum of Ethyl anilino (3-chloro-4-fluoro) methylenemalonate in DMSO-d_6.

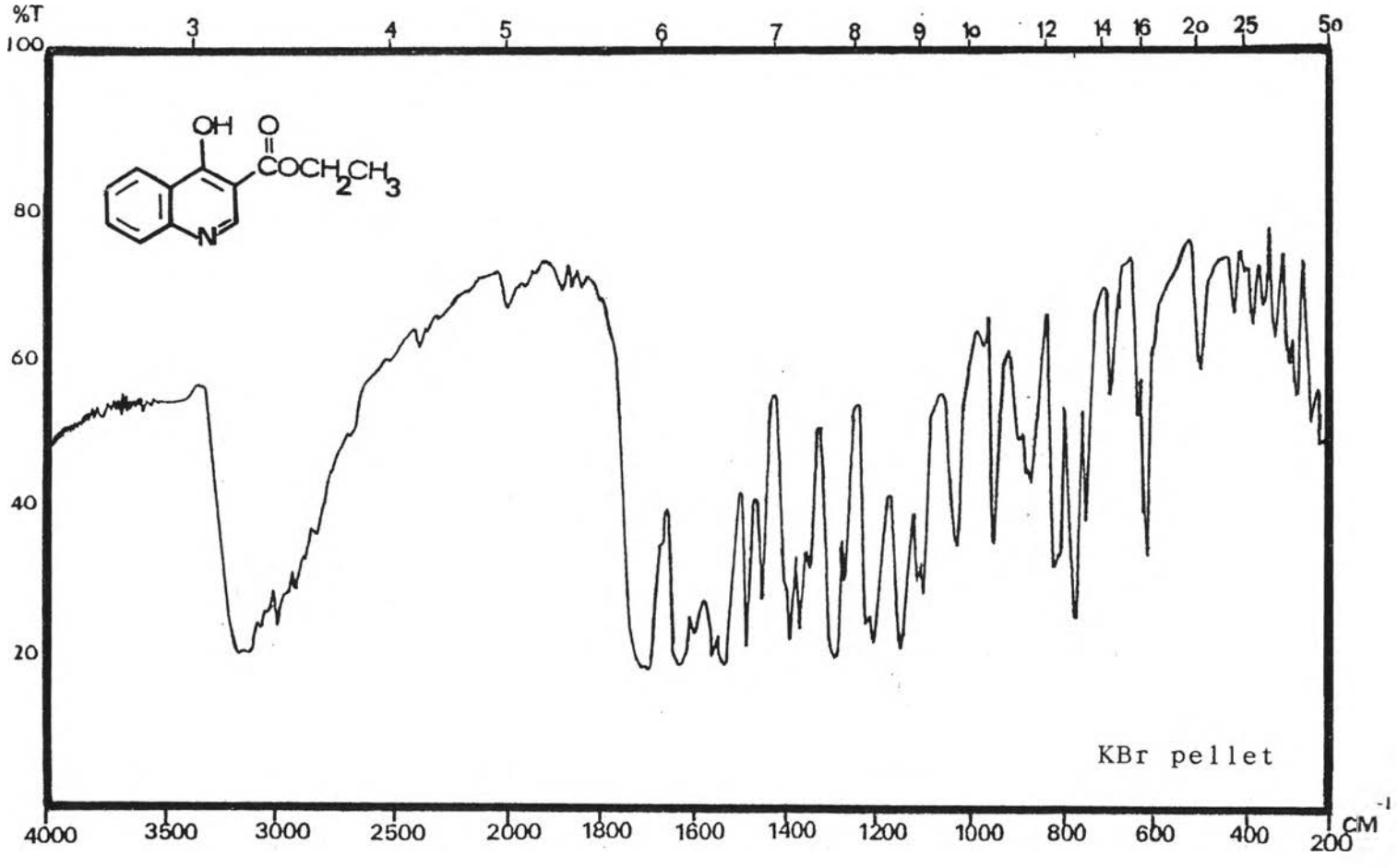


Figure 8 The IR spectrum of 3-Carboethoxy -4-hydroxy quinoline.

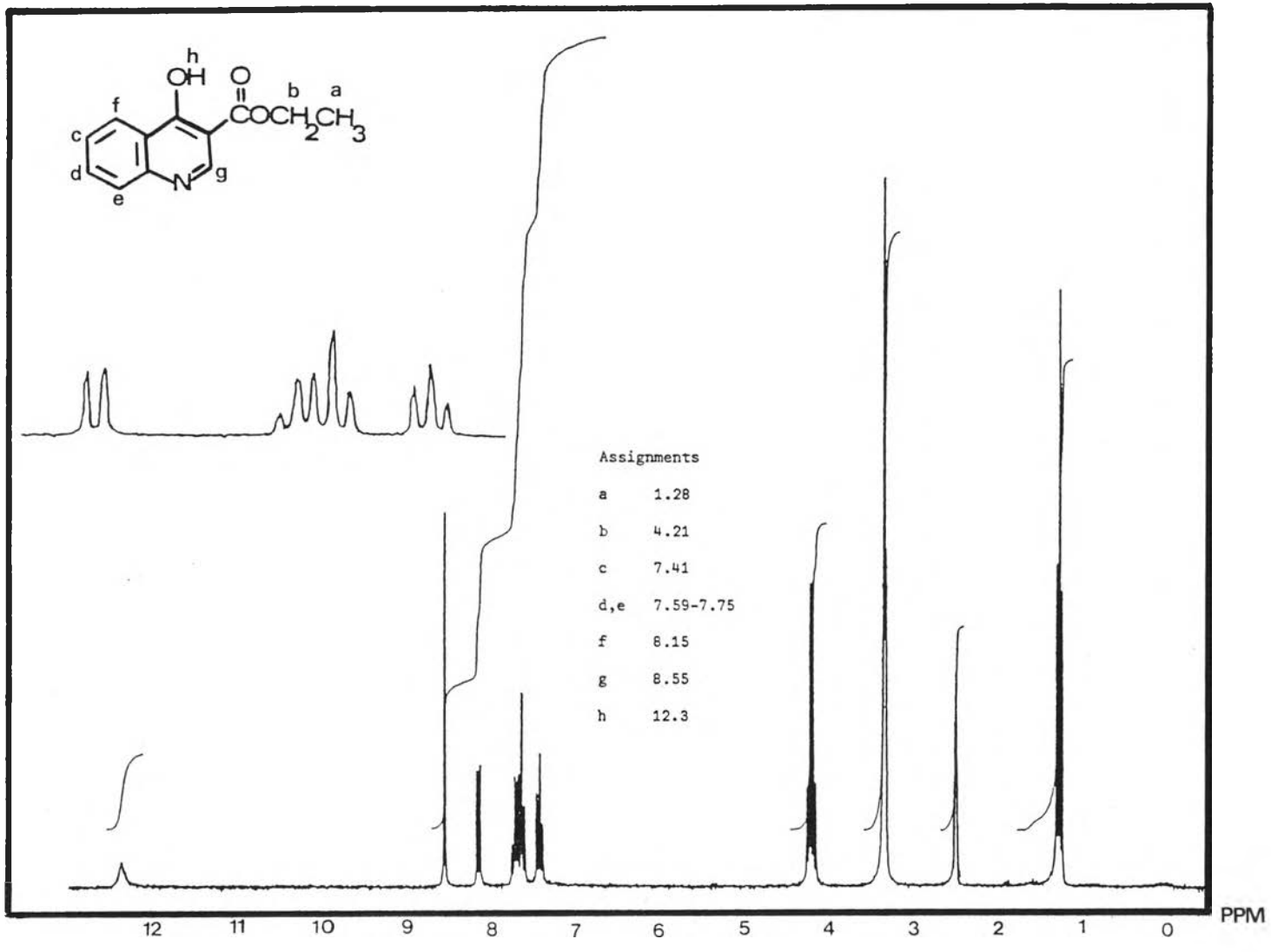


Figure 9 The ^{1}H-NMR spectrum of 3-Carboethoxy -4-hydroxyquinoline in DMSO-d_6.

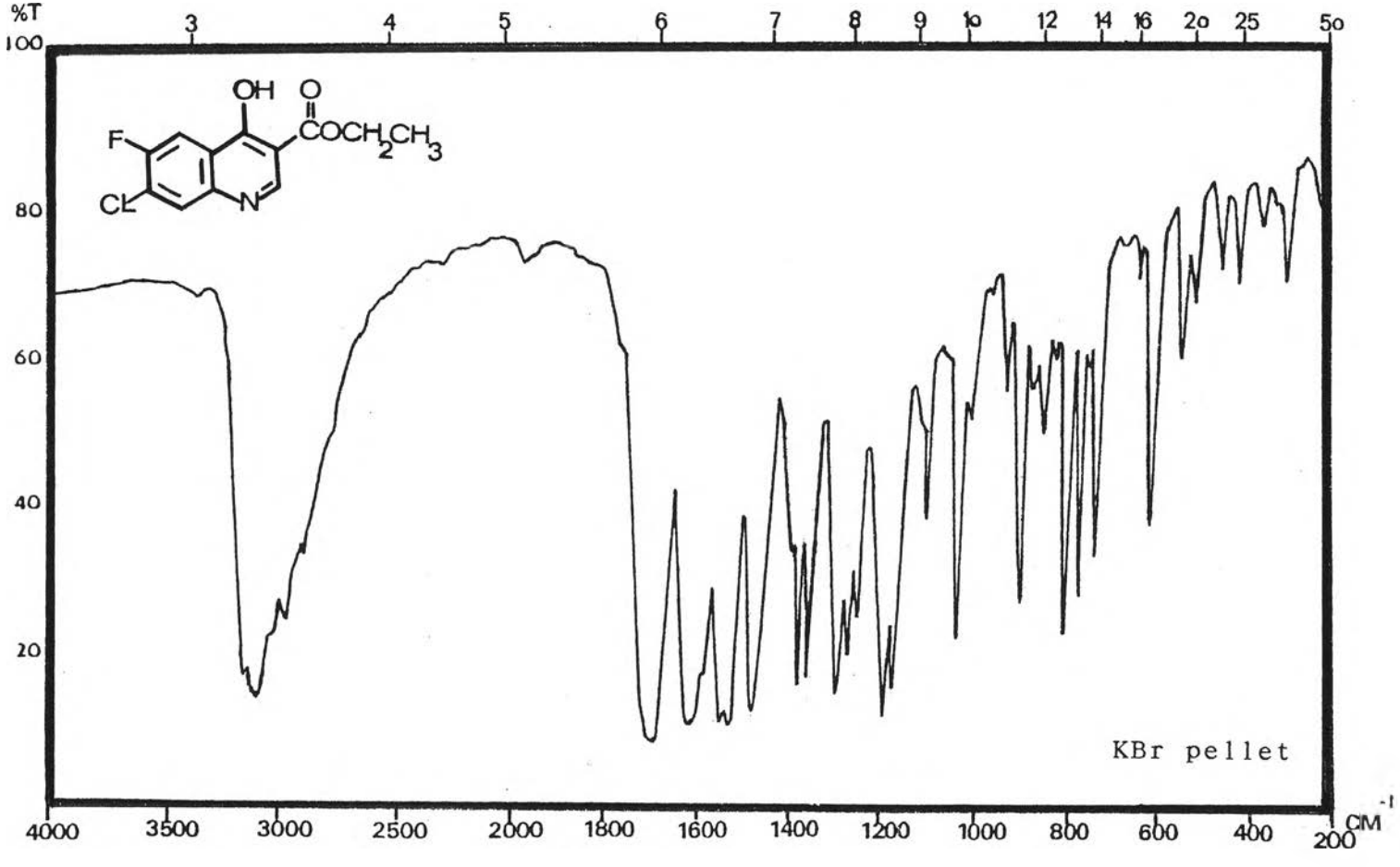


Figure 10 The IR spectrum of 3-Carboethoxy -7-chloro-6-fluoro -4-hydroxyquinoline.

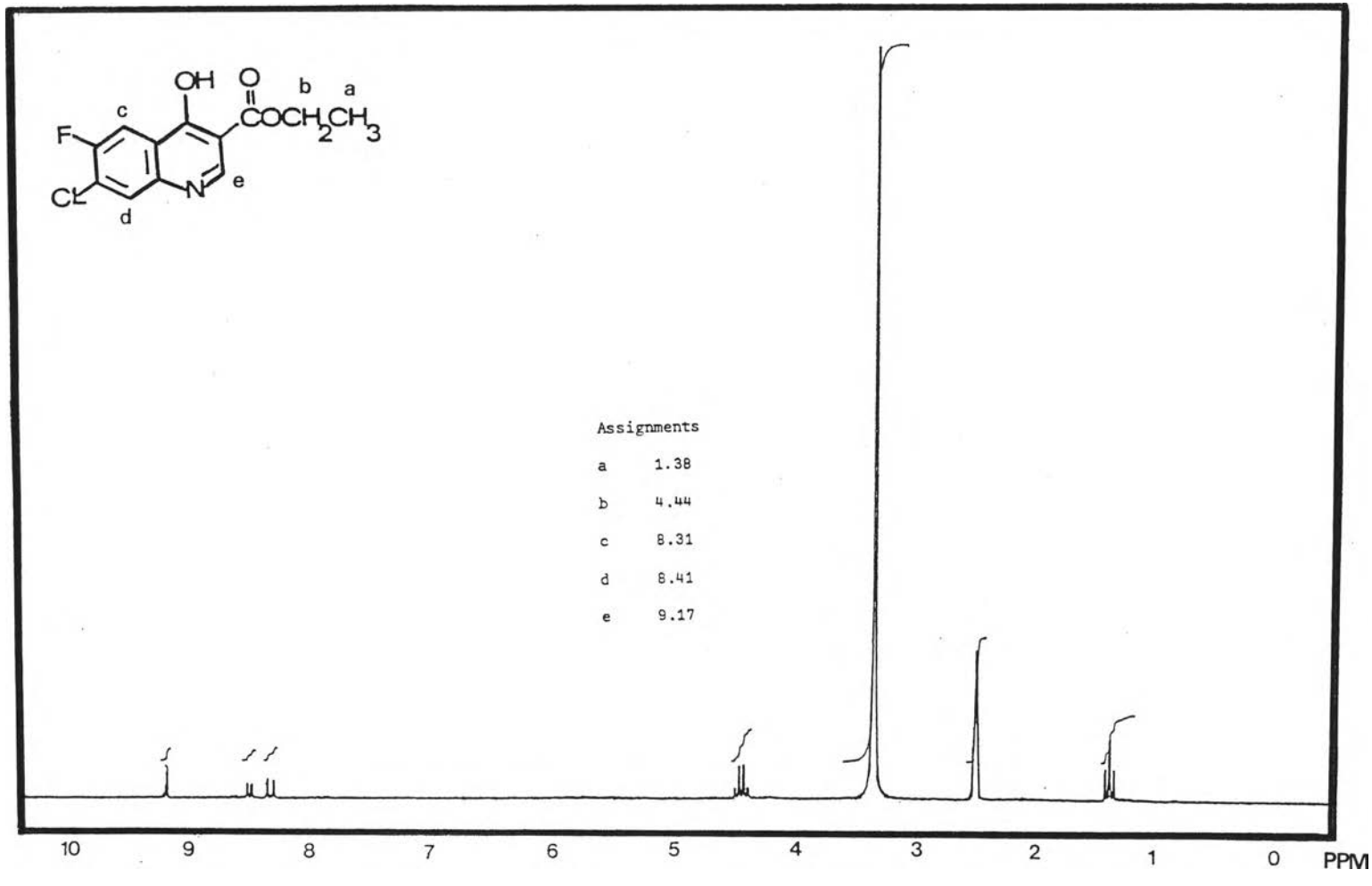


Figure 11 The ^{1}H-NMR spectrum of 3-Carboethoxy -7- chloro -6-fluoro -4-hydroxyquinoline in DMSO-d_6.

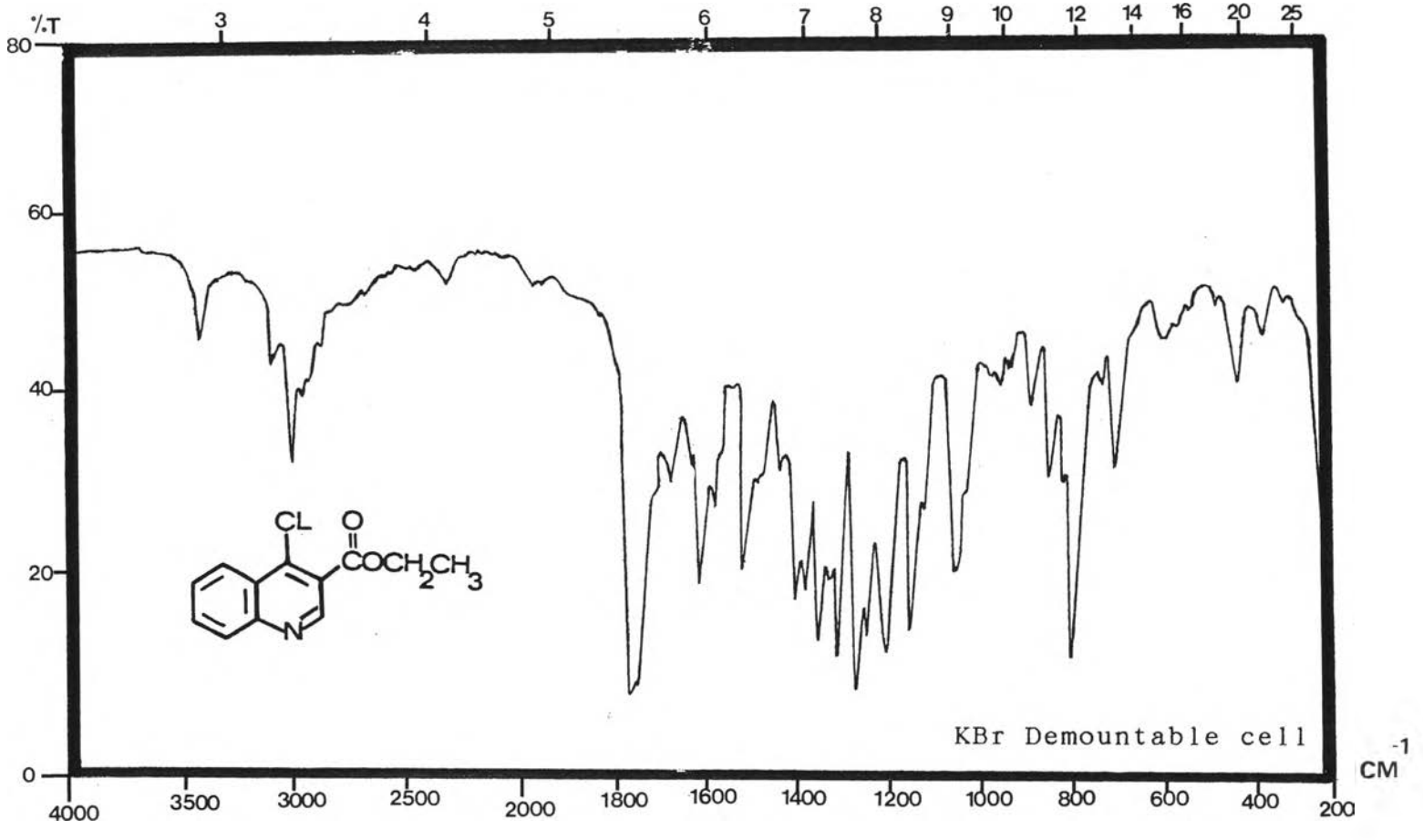


Figure 12 The IR spectrum of 3-Carboethoxy-4-chloroquinoline.

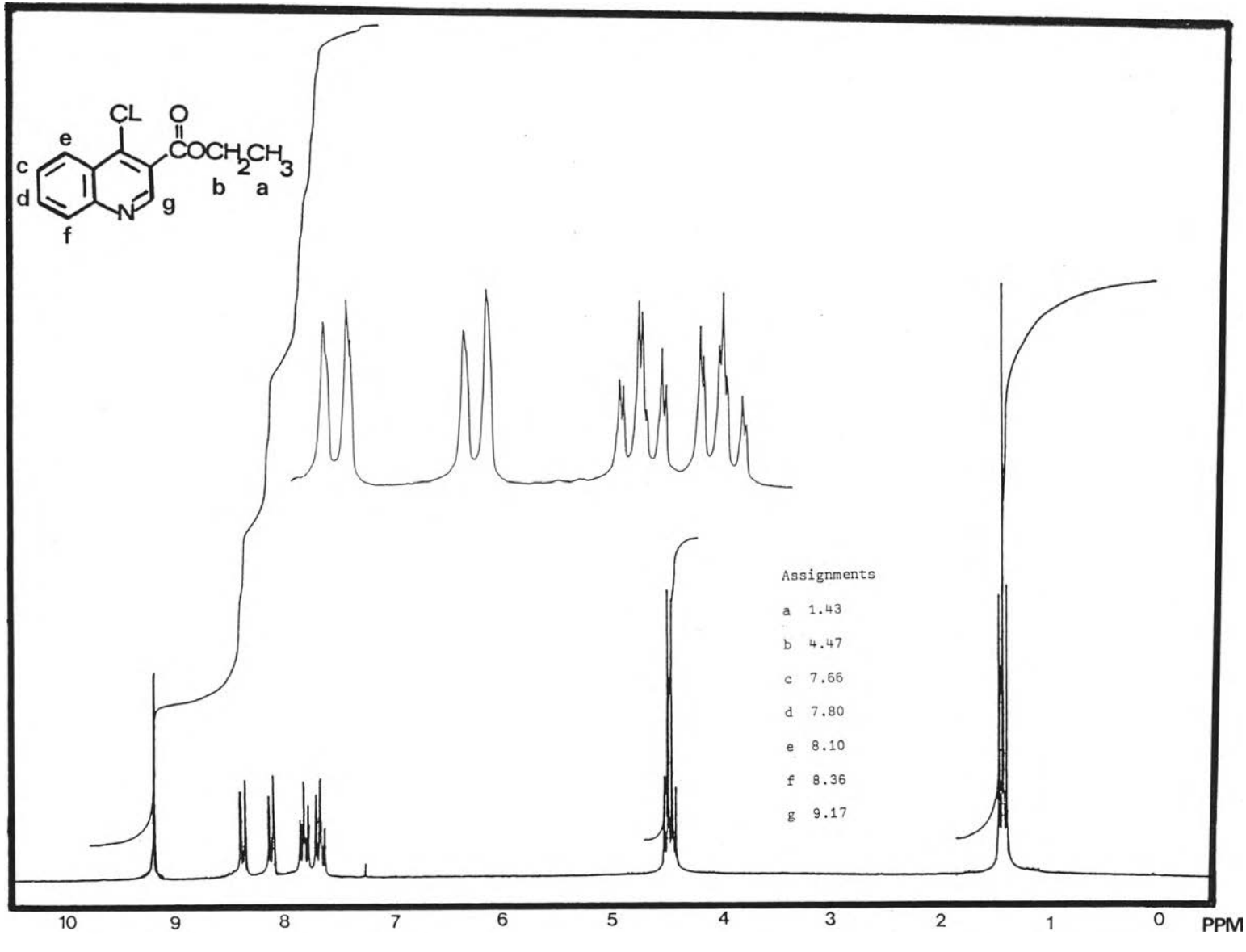


Figure 13 The ^{1}H-NMR spectrum of 3-Carboethoxy -4-chloro-quinoline in $CDCl_3$.

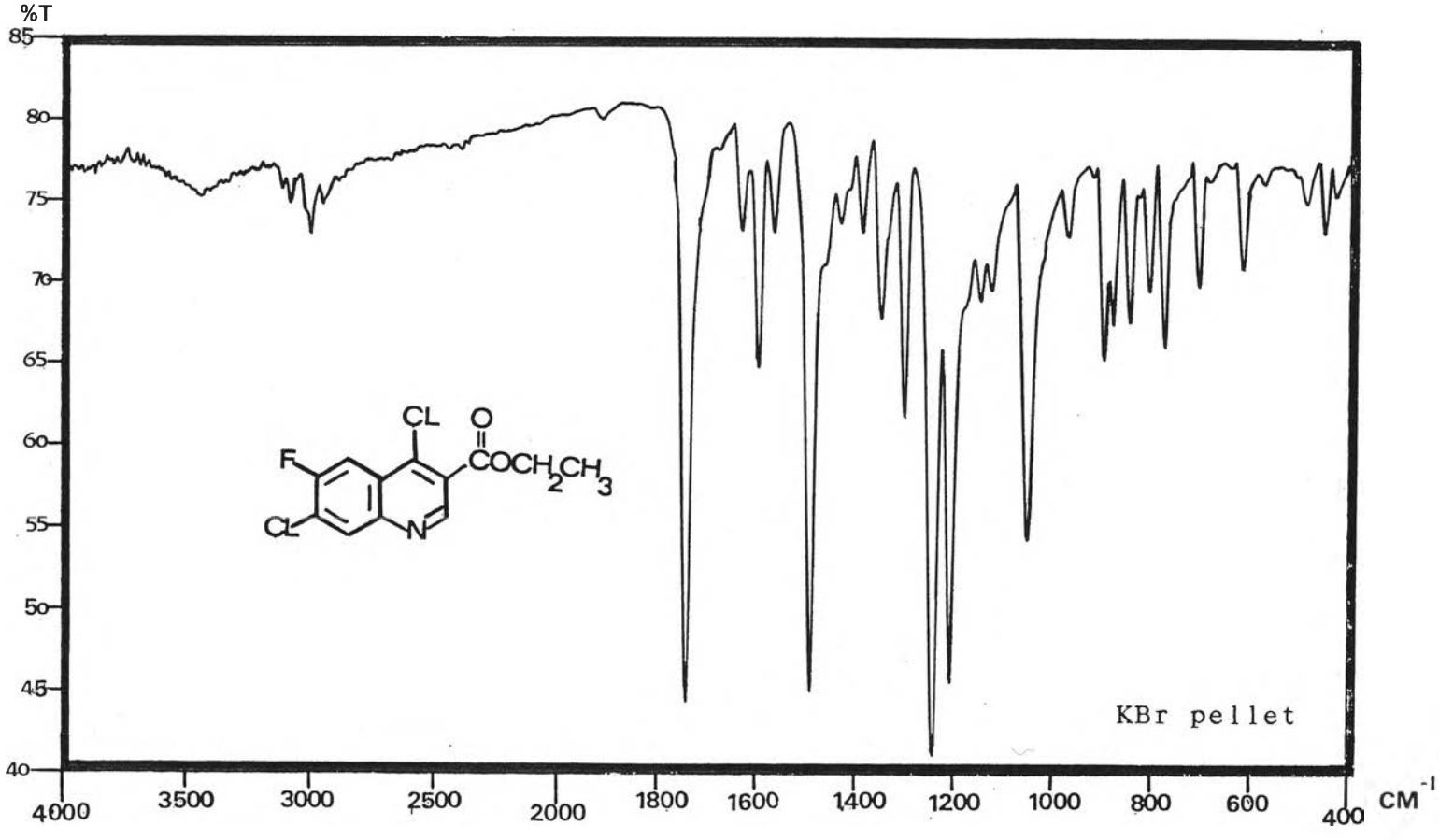


Figure 14 The IR spectrum of 3-Carboethoxy -4, 7-dichloro-6-fluoro-quinoline.

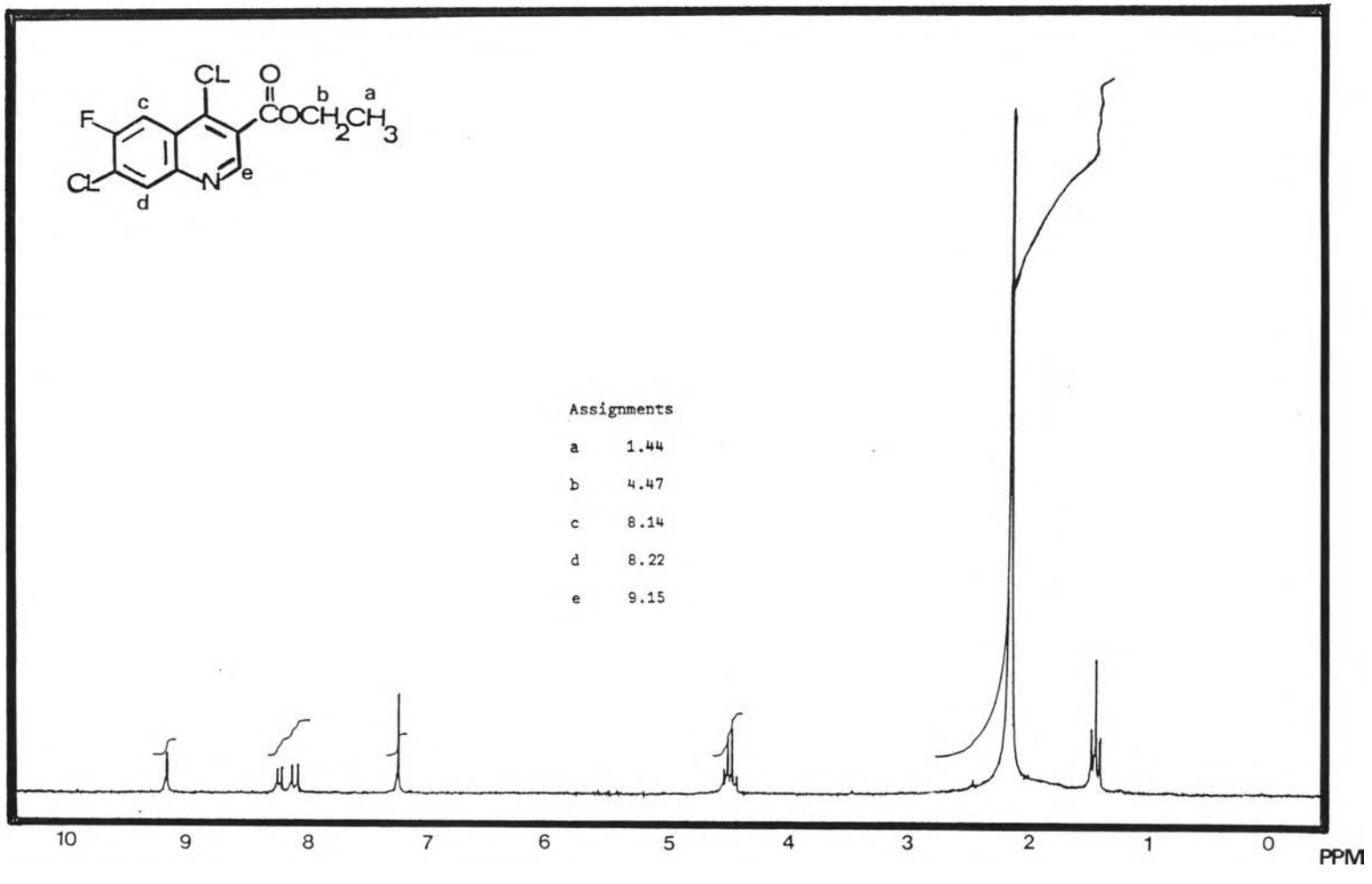


Figure 15 The ^{1}H-NMR spectrum of 3-Carboethoxy -4,7-dichloro-6-fluoro-quinoline in DMSO-d_6 with $CDCl_3$.

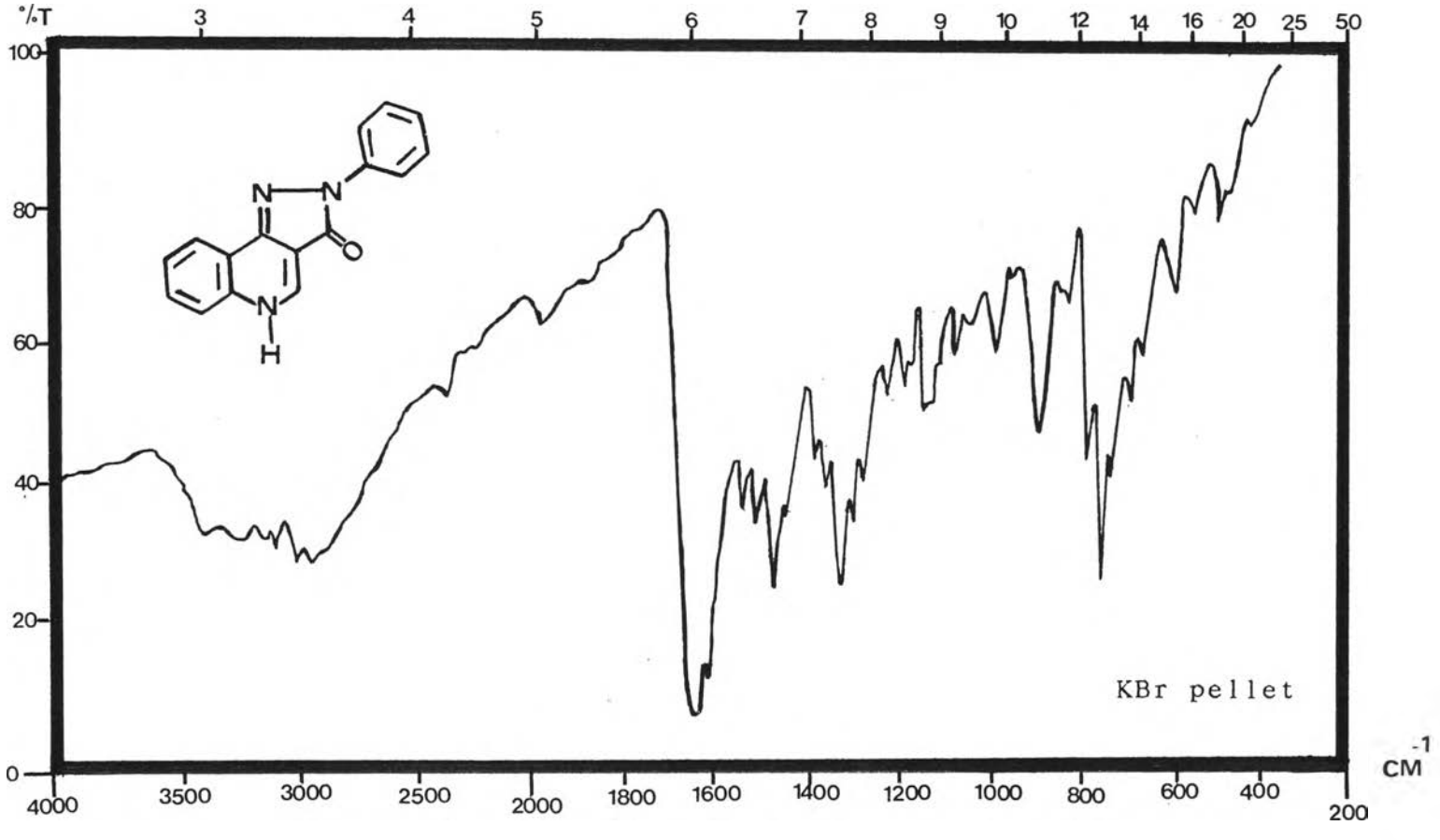


Figure 16 The IR spectrum of 2-Arylpyrazolo [4,3-c] quinolin-3-one.

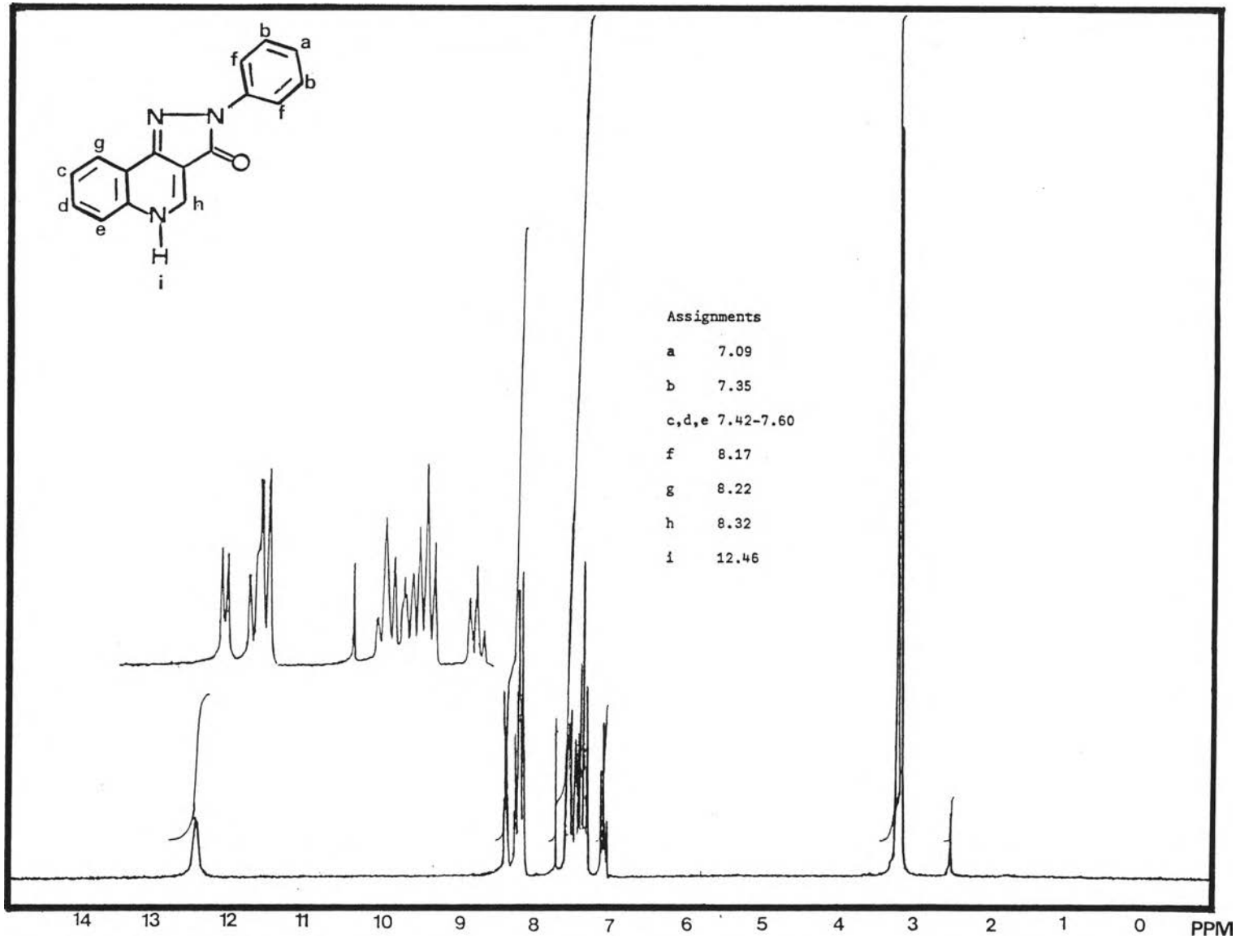


Figure 17 The ^{1}H-NMR spectrum of 2-Arylpyrazolo [4, 3-c] quinolin -3-one in DMSO-d_6.

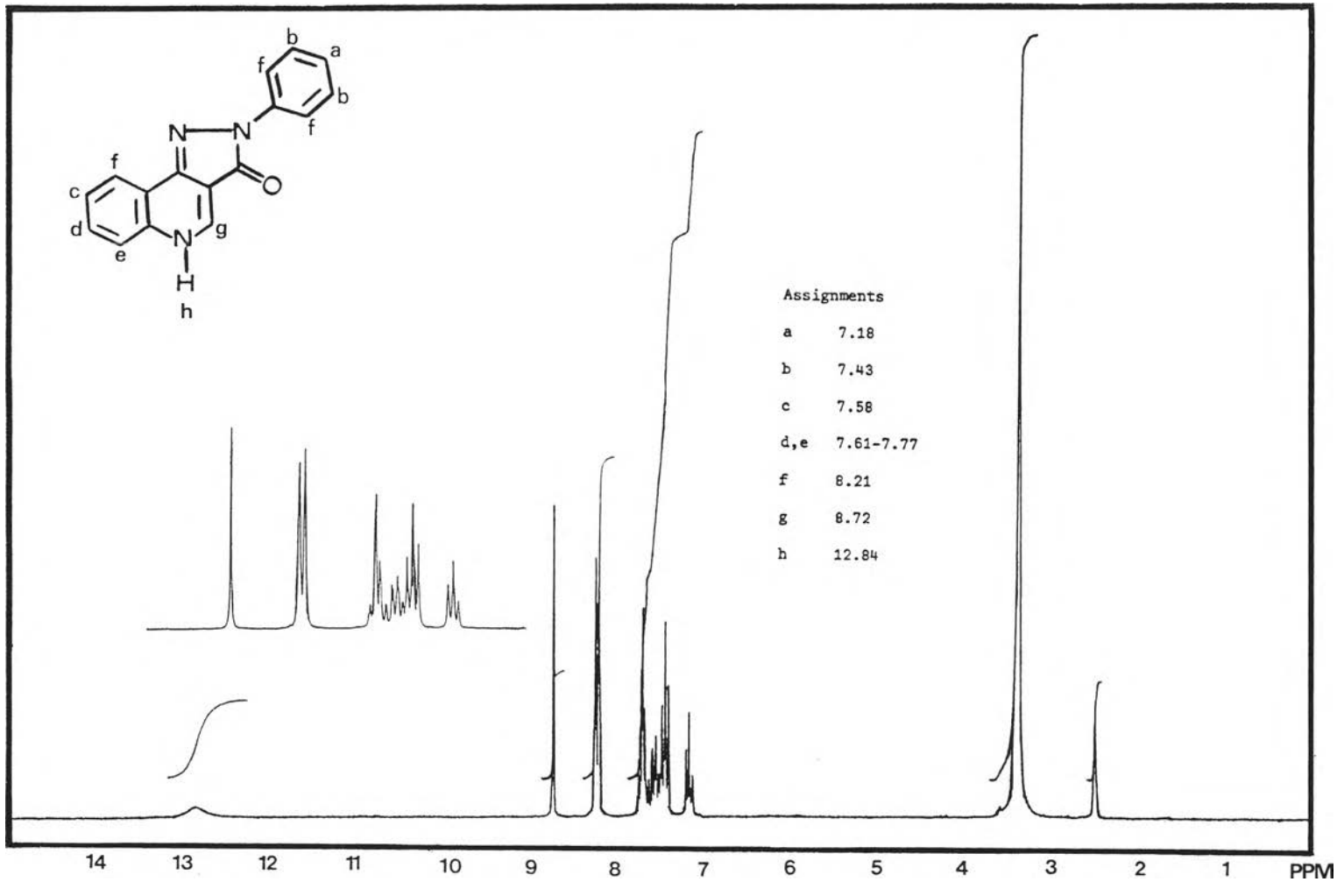


Figure 18 The ^{1}H-NMR spectrum of 2-Arylpyrazolo [4, 3-c] quinolin -3-one in DMSO-d_6 with $CDCl_3$.

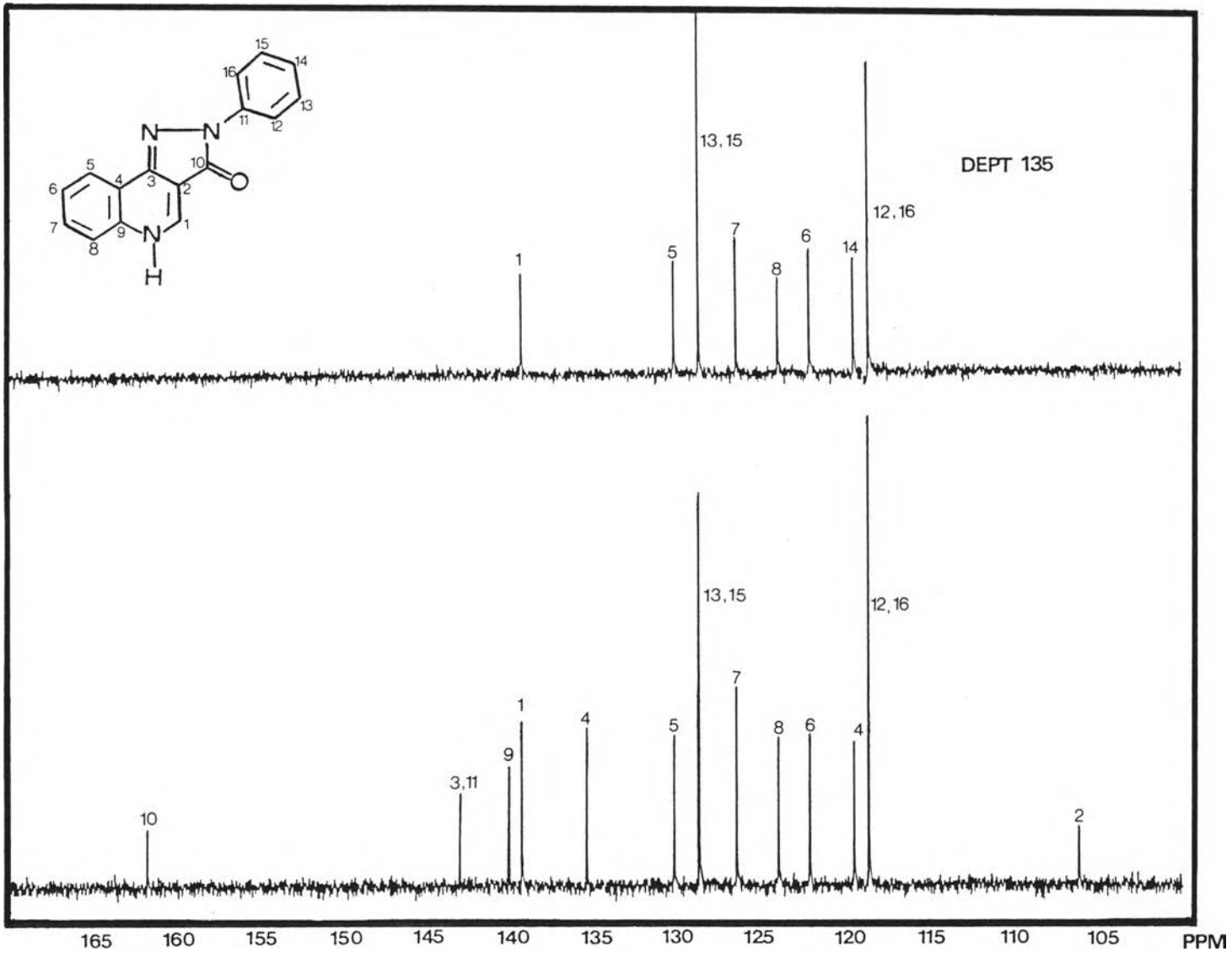


Figure 19 The ^{13}C-NMR spectrum of 2-Arylpyrazolo [4,3-c] quinolin -3-one.

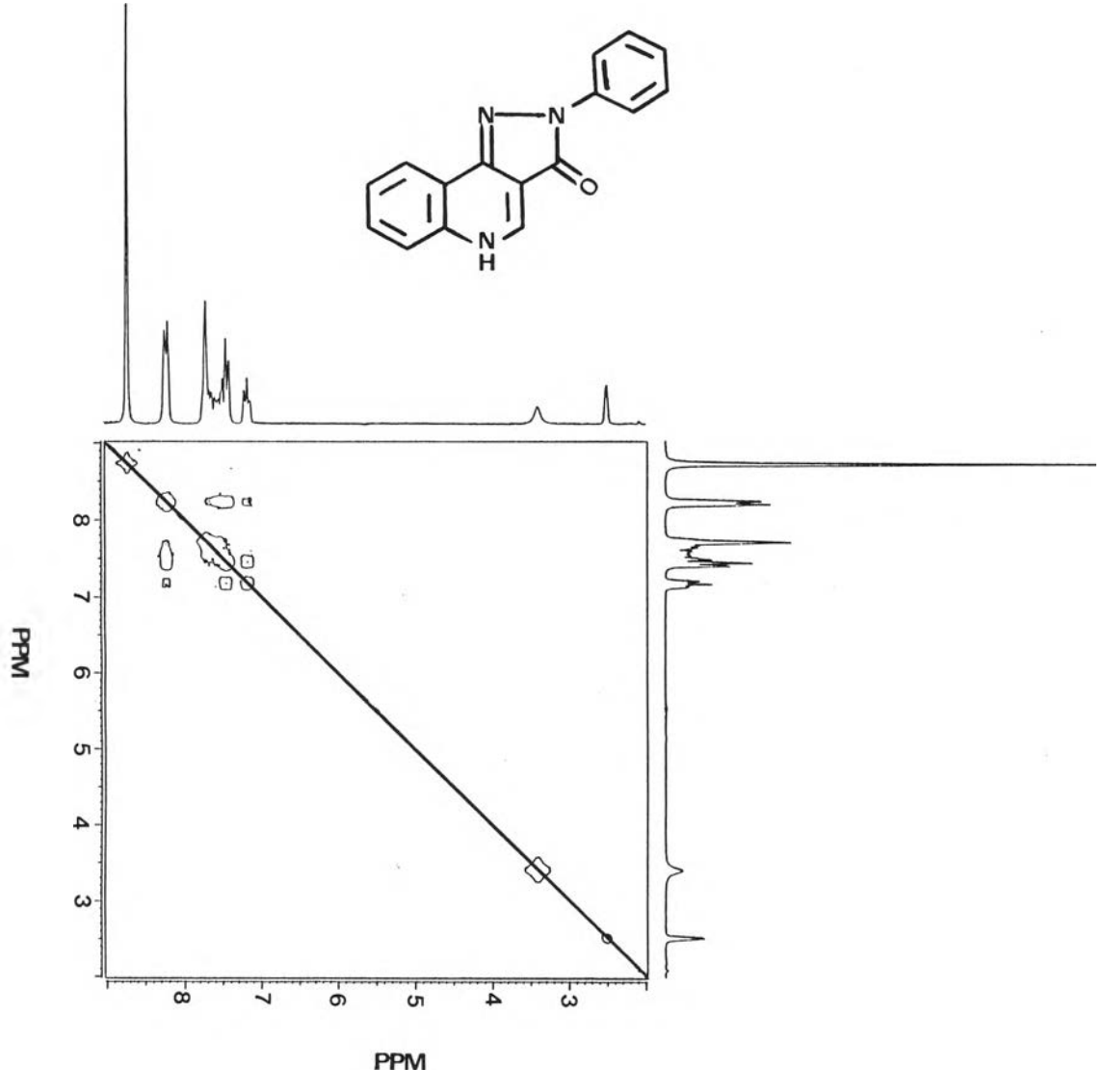


Figure 20 The COSY spectrum of 2-Arylpyrazolo [4, 3-c] quinolin -3-one in DMSO-d_6.

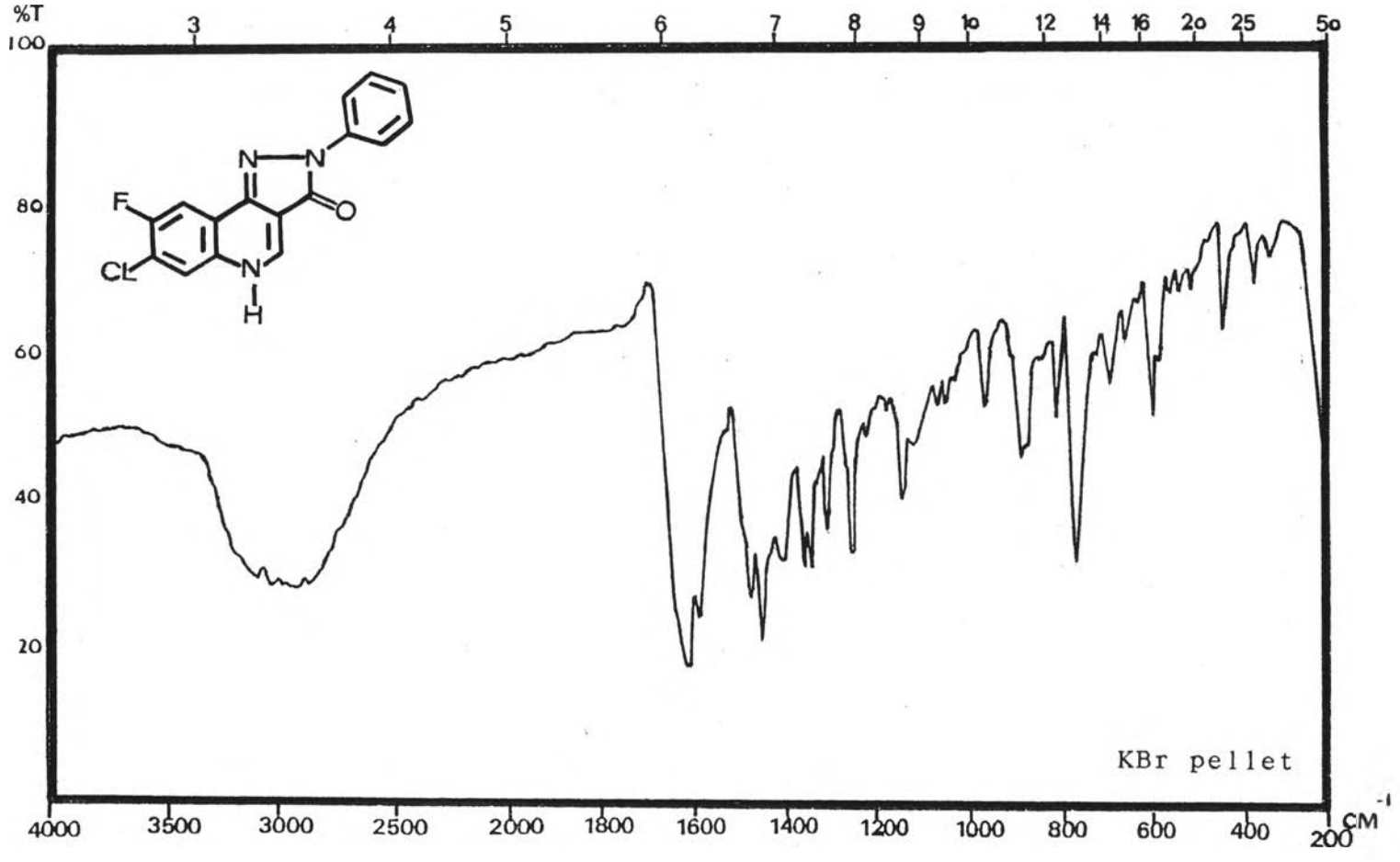


Figure 21 The IR spectrum of 7-Chloro -8-fluoro-2-arylpyrazolo [4, 3-c] quinolin -3-one.

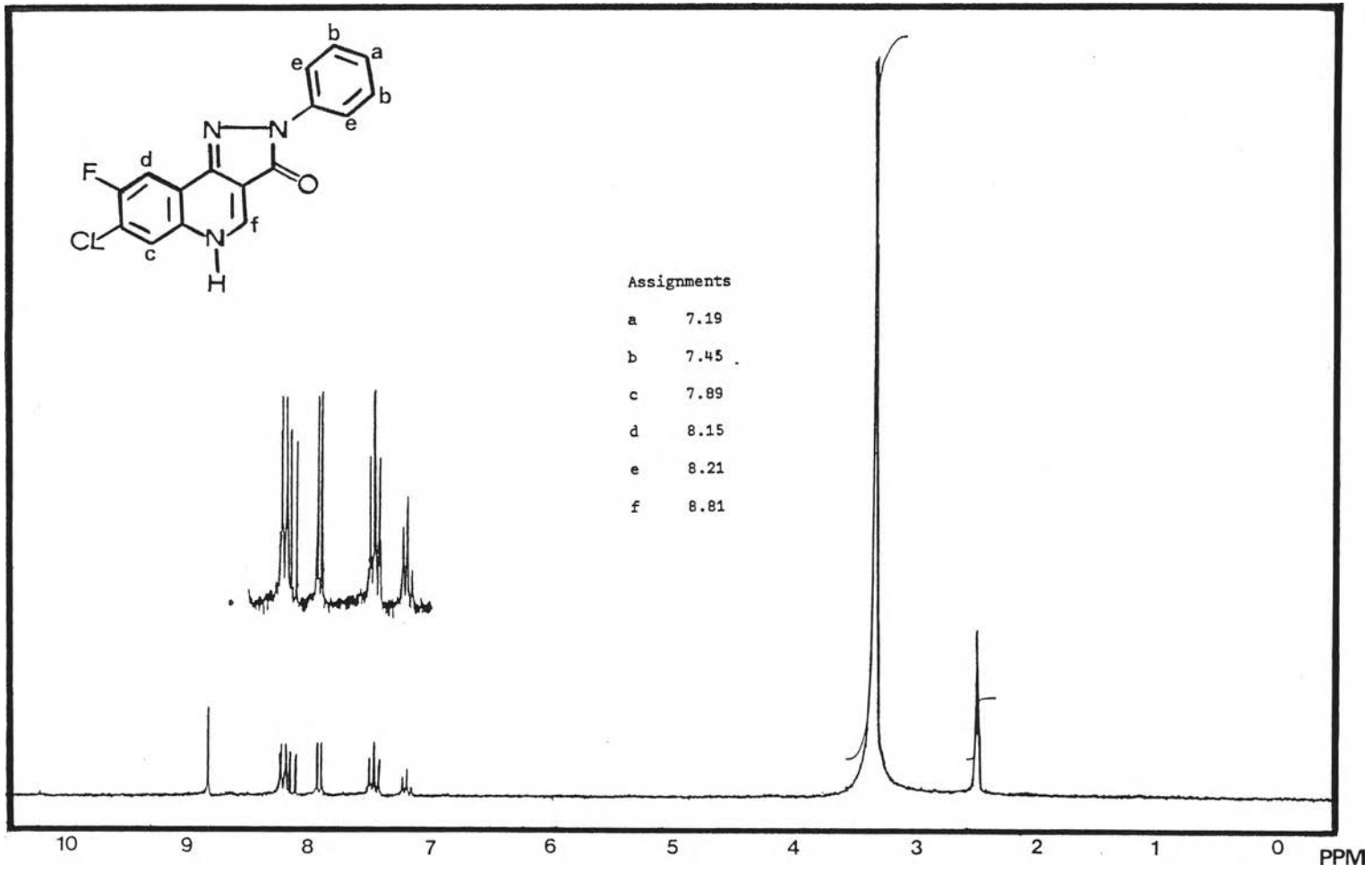


Figure 22 The ^{1}H-NMR spectrum of 7-Chloro-8-fluoro-2-arylpyrazolo [4, 3-c] quinolin -3-one in DMSO-d_6.

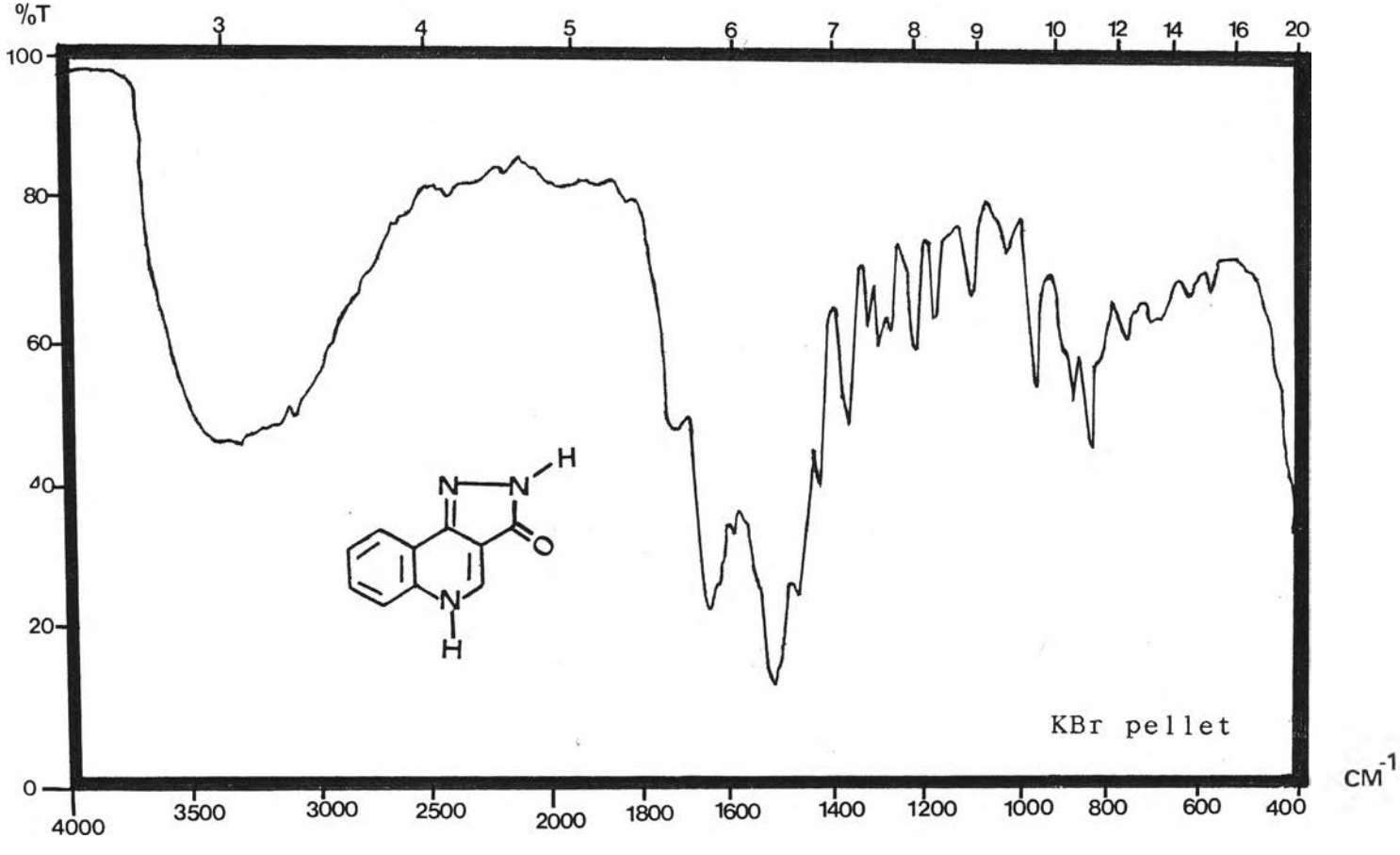


Figure 23 The IR spectrum of 2H - pyrazolo [4,3-c] quinolin -3-one.

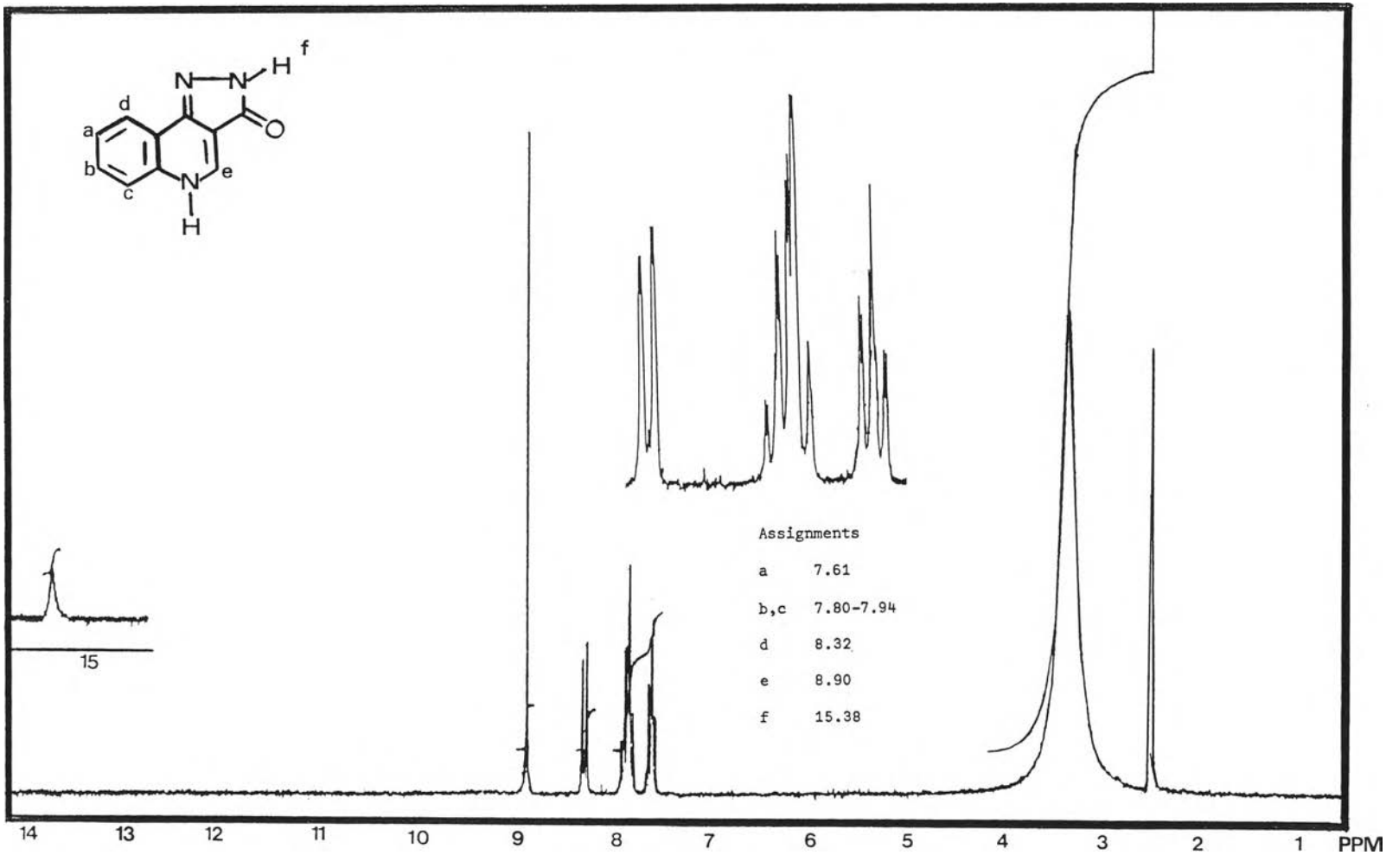


Figure 24 The ^{1}H-NMR spectrum of 2H-pyrazolo [4,3-c] quinolin -3-one in DMSO-d_6.

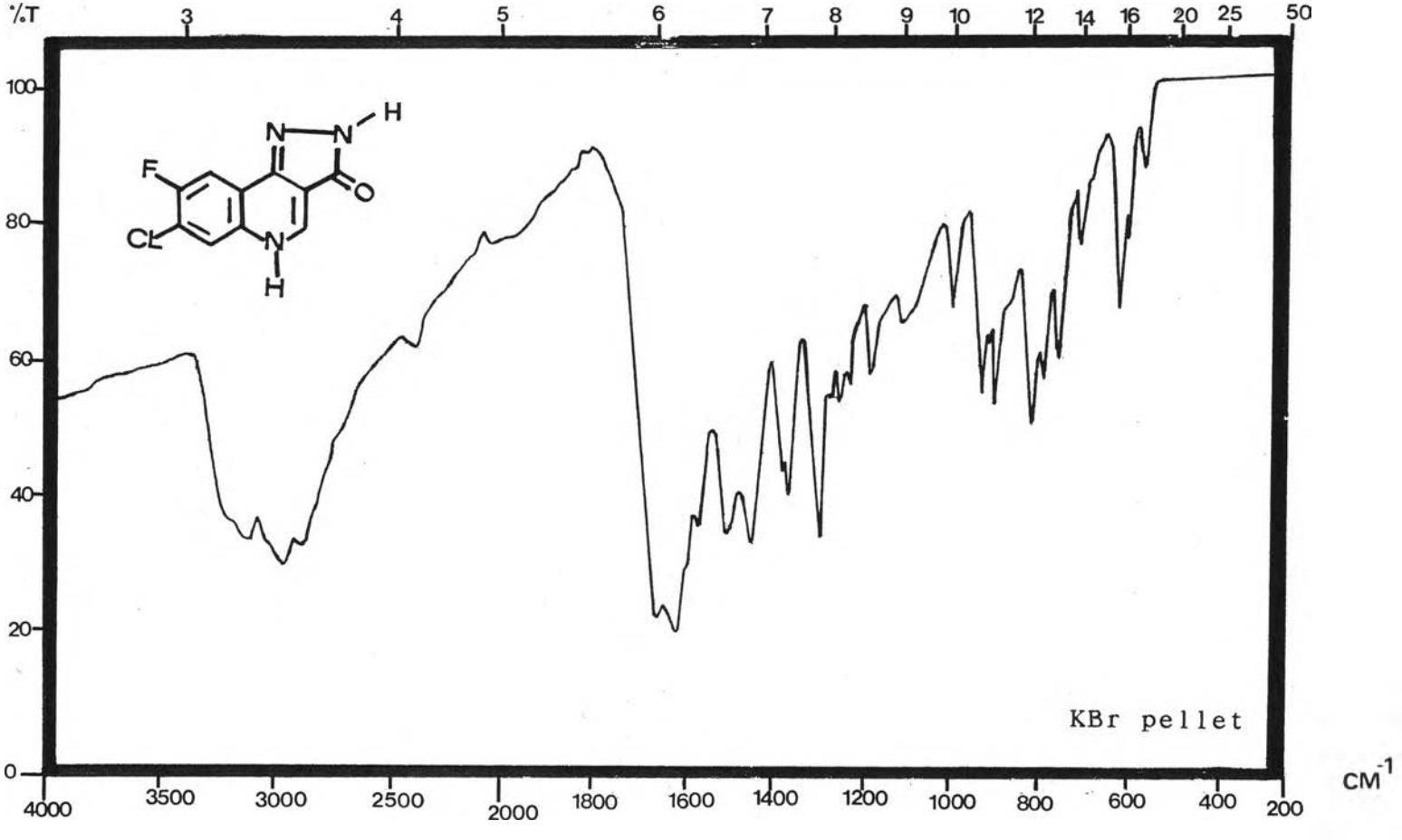


Figure 25 The IR spectrum of 7-Chloro-8-fluoro-2H-pyrazolo [4,3-c] quinoloin -3-one.

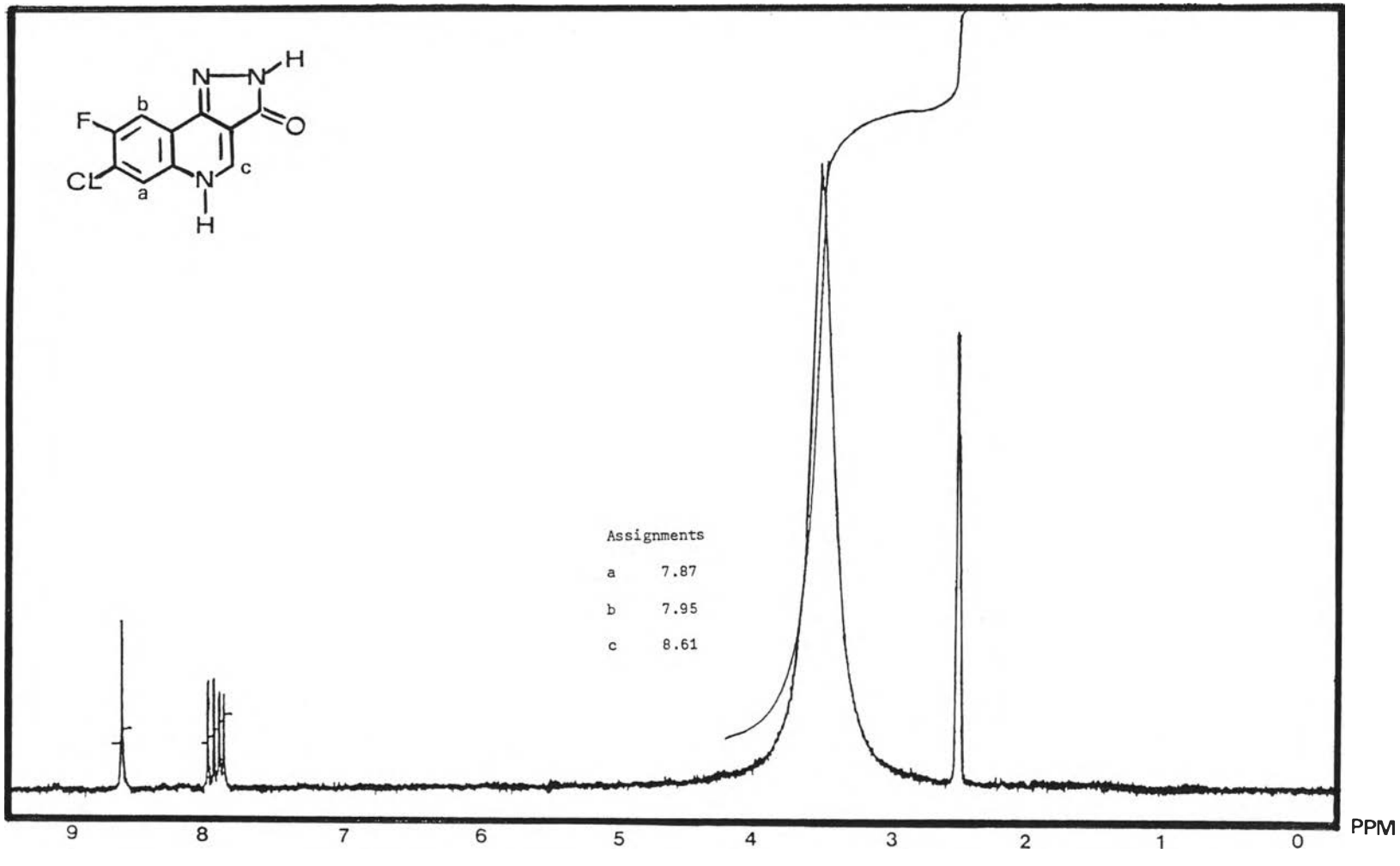


Figure 26 The ^{1}H-NMR spectrum of 7-Chloro-8-fluoro-2H-pyrazolo [4,3-c] quinolin -3-one in DMSO-d_6.

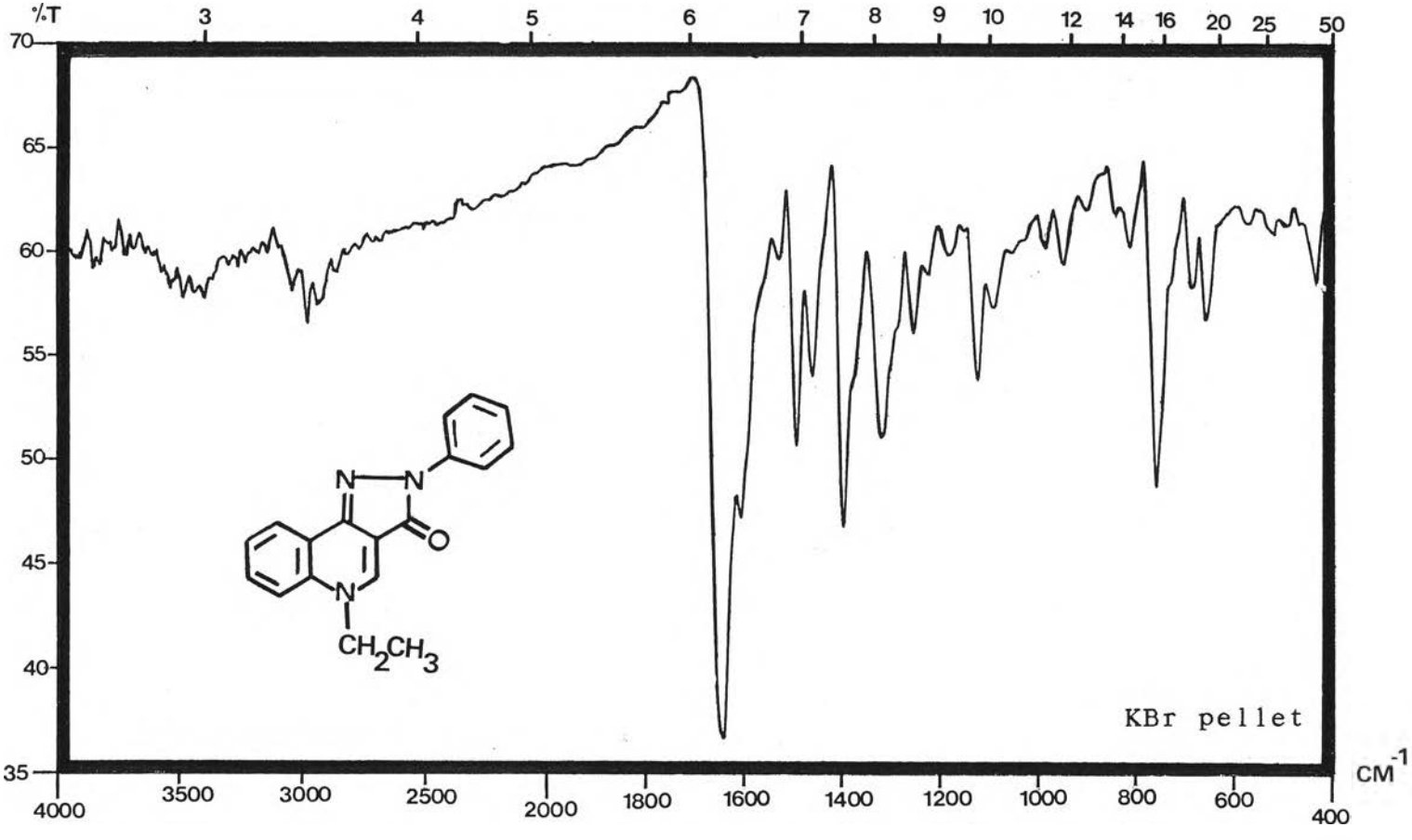


Figure 27 The IR spectrum of 5-Ethyl -2- arylpyrazolo [4,3-c] quinolin -3-one.

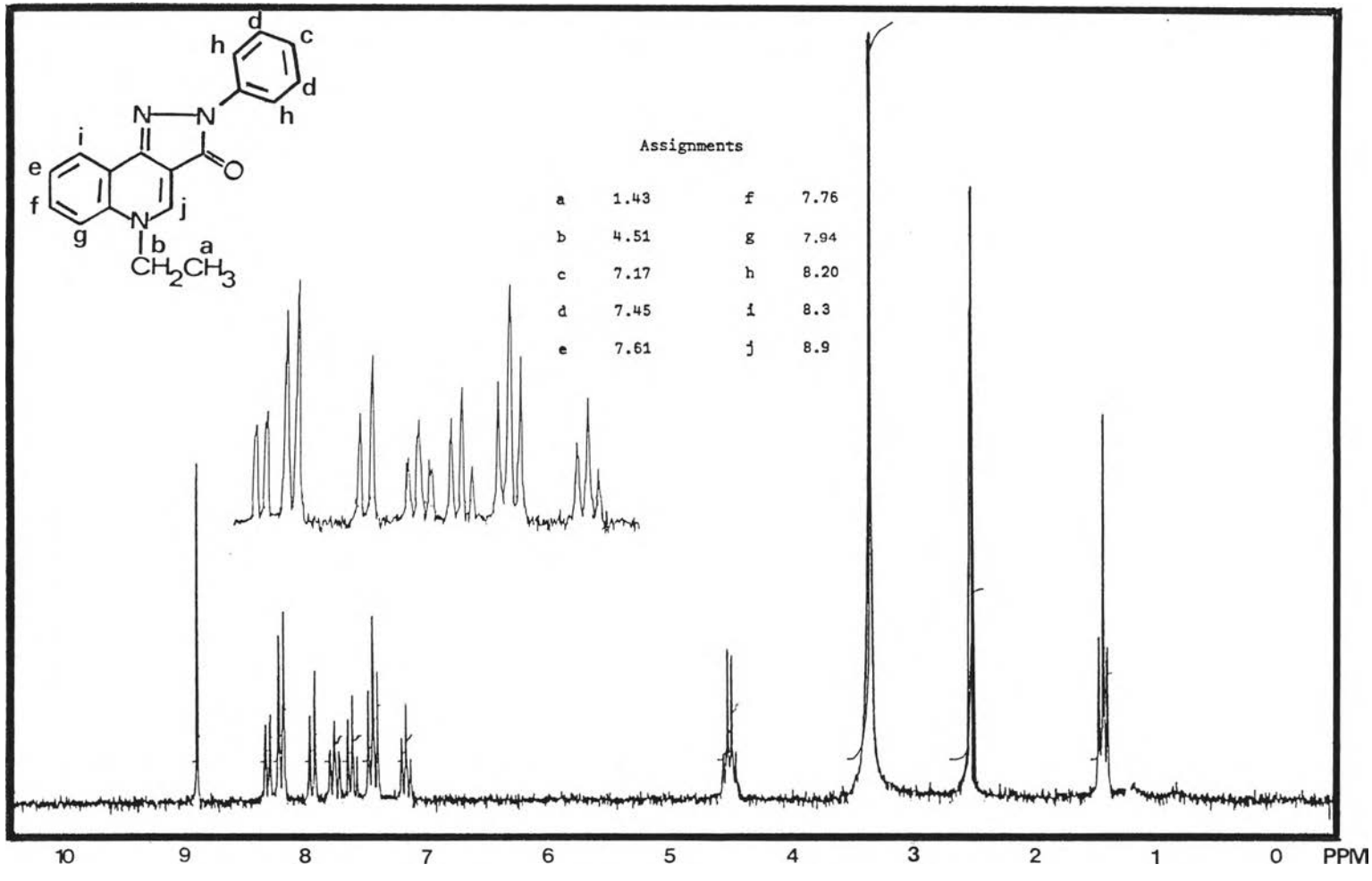


Figure 28 The ^{1}H-NMR spectrum of 5-Ethyl -2-arylpyrazolo [4,3-c] quinolin -3-one in DMSO-d_6.

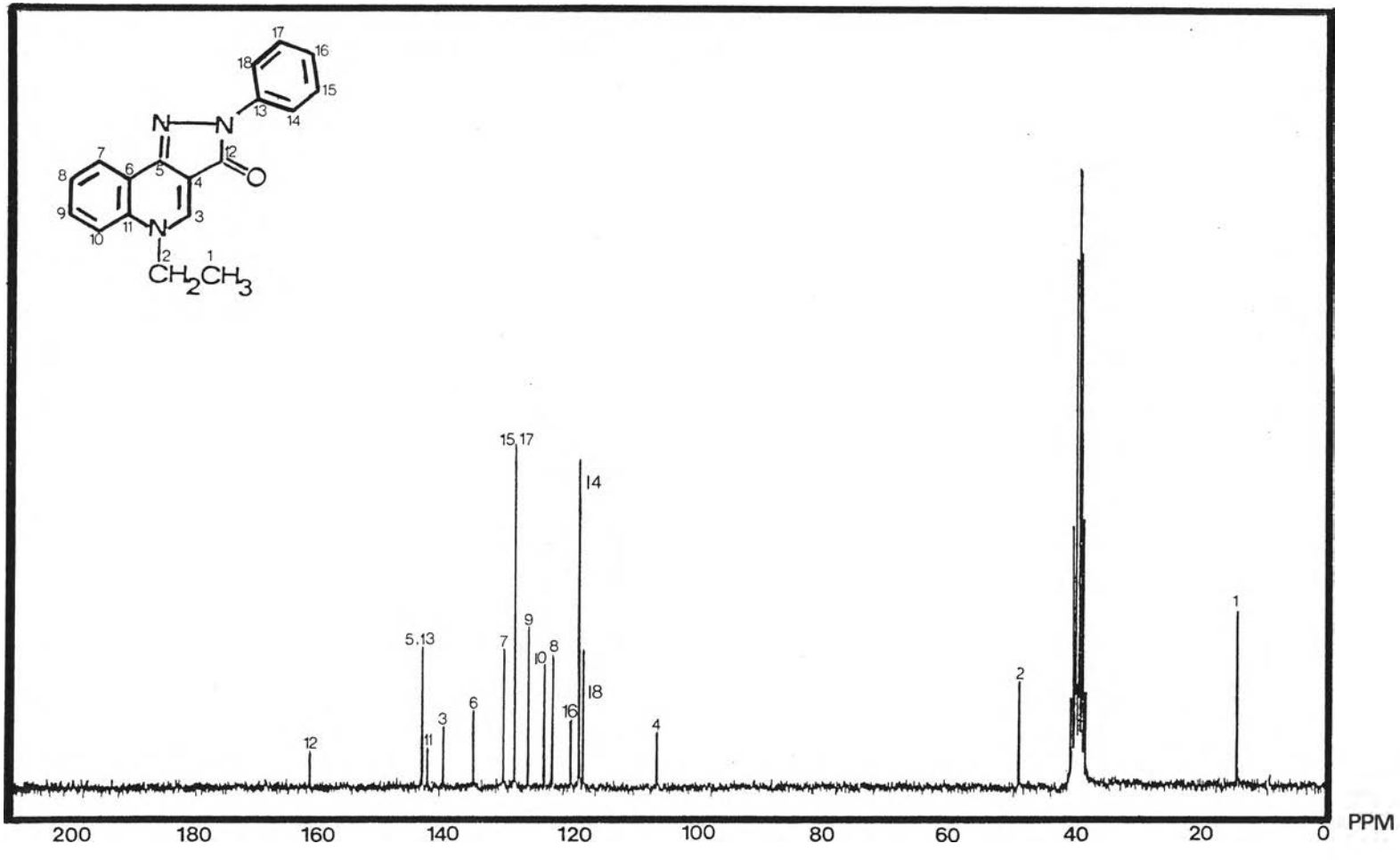


Figure 29 The ^{13}C-NMR spectrum of 5-Ethyl -2-arylpyrazolo [4,3-c] quinolin -3-one in DMSO-d_6.

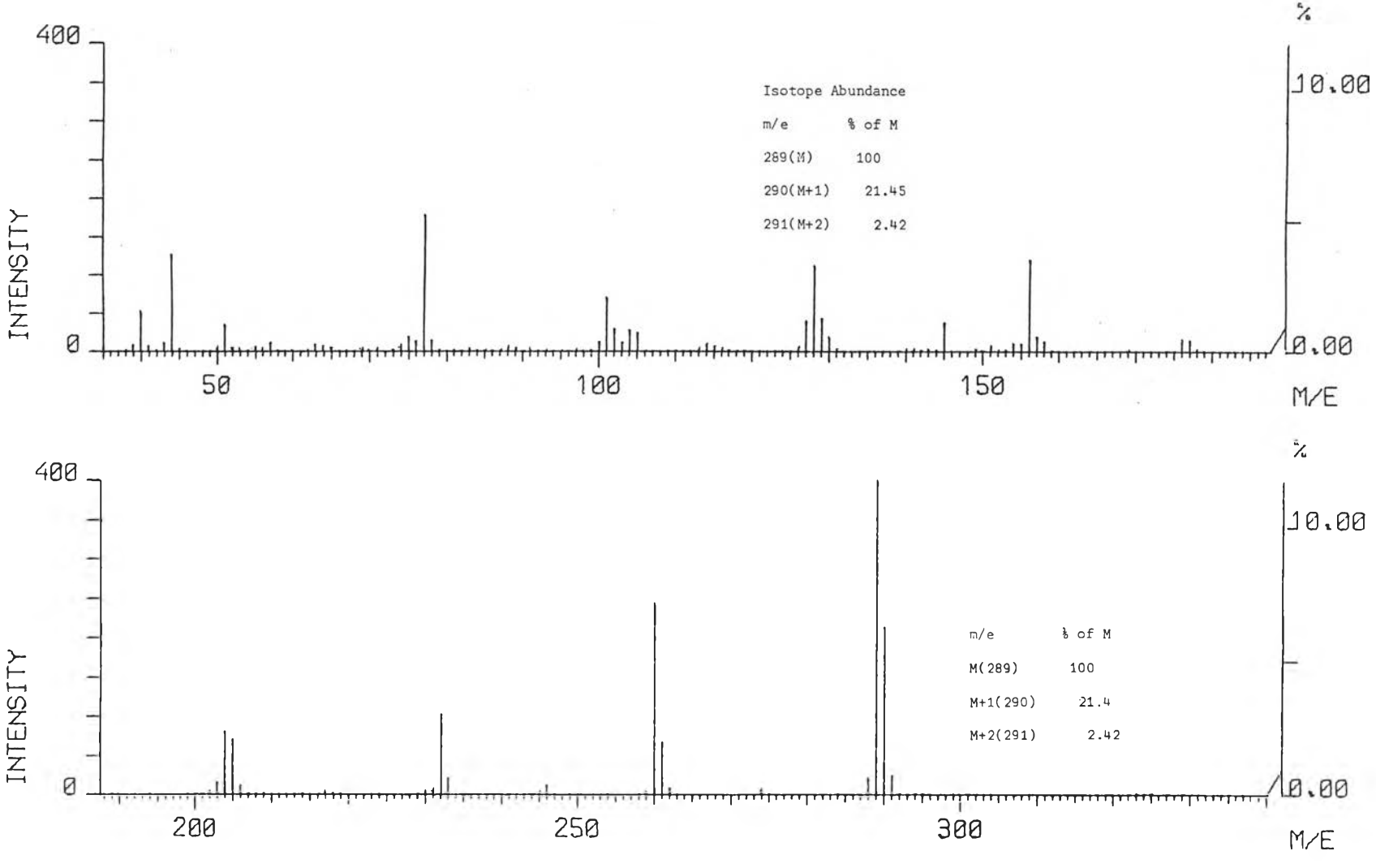


Figure 30 The mass spectrum of 5-Ethyl -2-arylpyrazolo [4,3-c] quinolin -3-one.

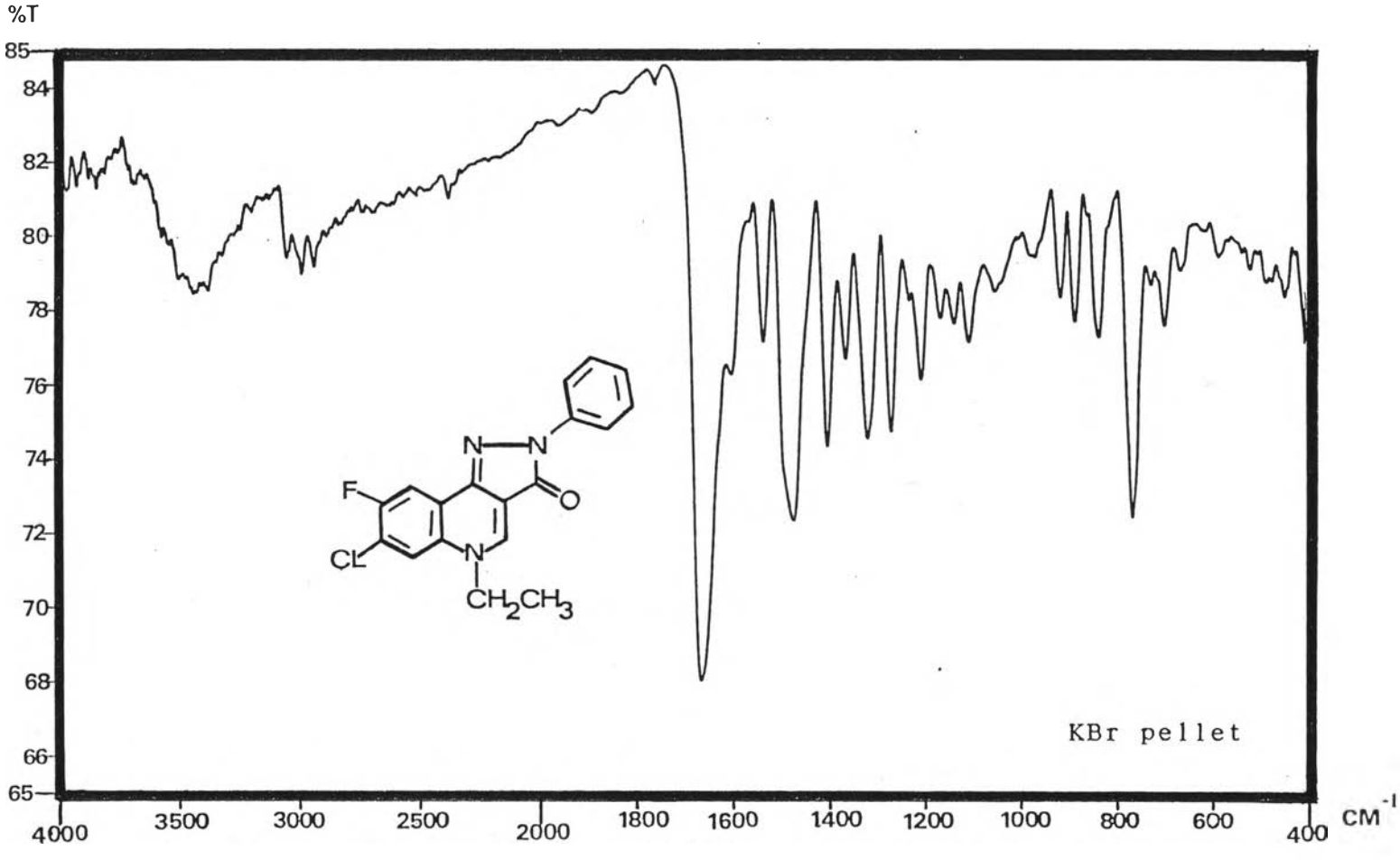


Figure 31 The IR spectrum of 7-Chloro -5-ethyl -8-fluoro -2-arylpyrazolo [4,3-c] quinolin -3-one.

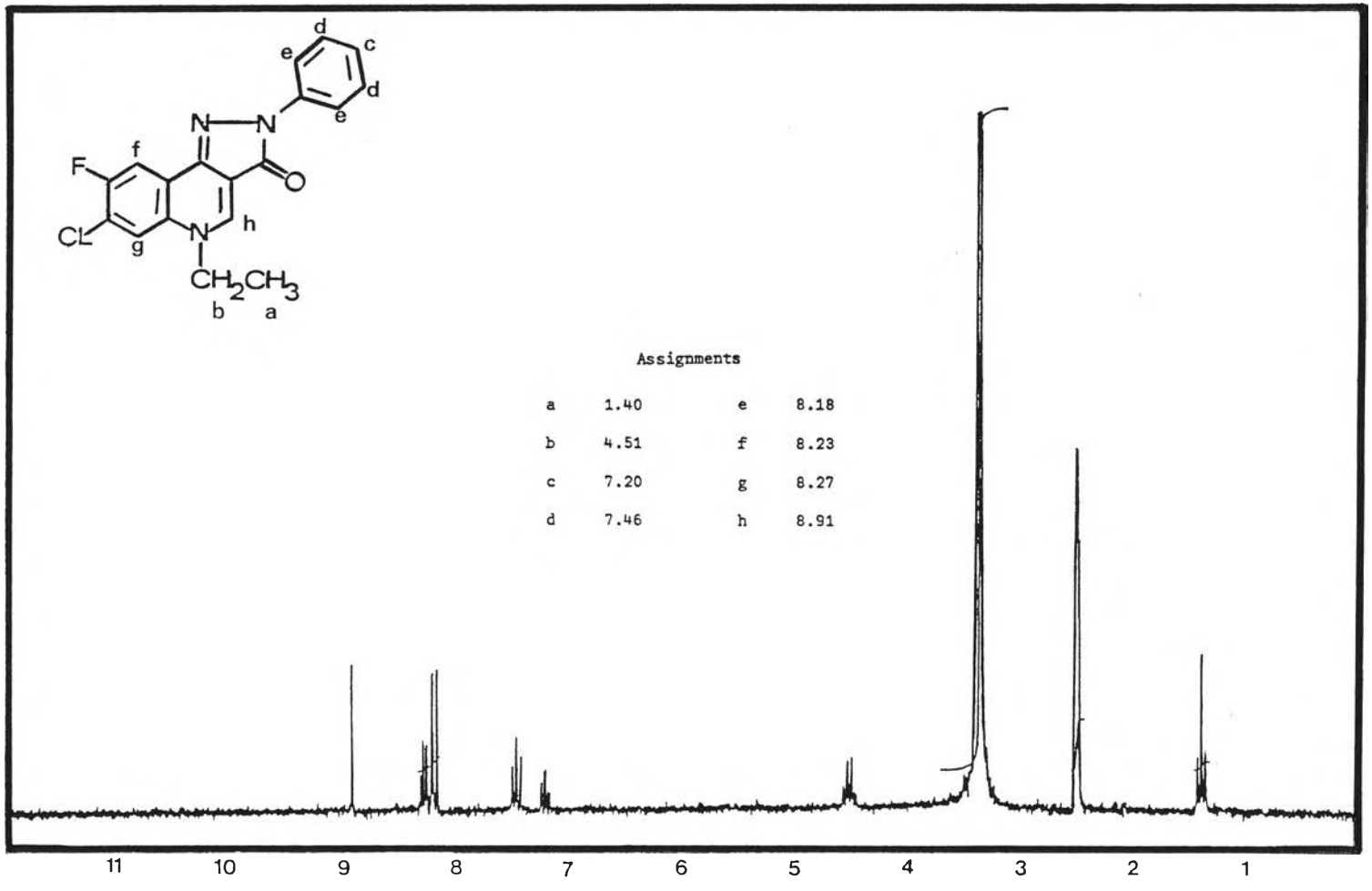


Figure 32 The ^{1}H-NMR spectrum of 7- Chloro-5-ethyl -8-fluoro-2-arylpyrazolo [4,3-c] quinolin -3-one in DMSO-d_6.

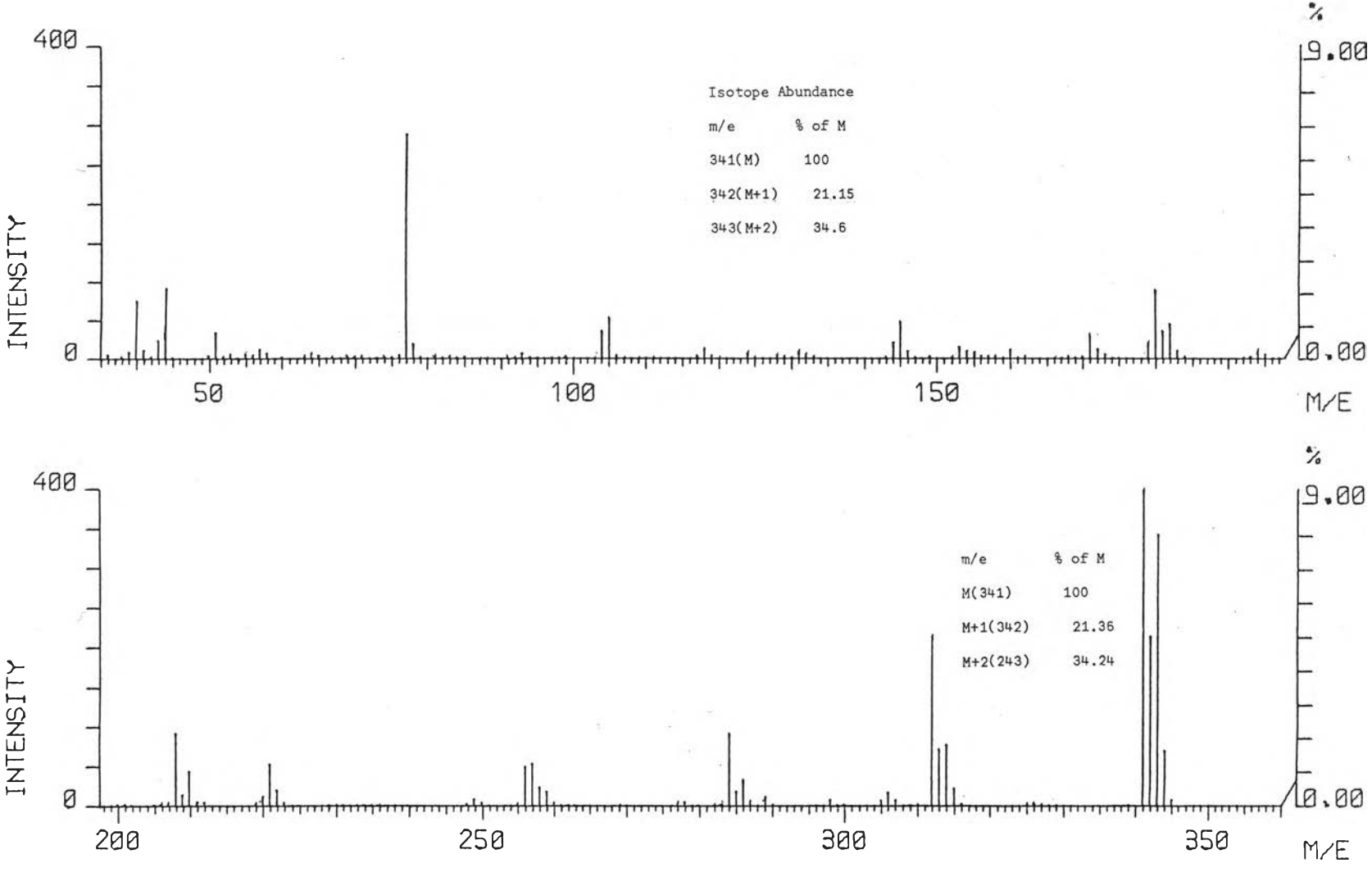


Figure 33 The mass spectrum of 7-Chloro -5-ethyl -8-fluoro-2-arylpyrazolo [4,3-c] quinolin -3-one.

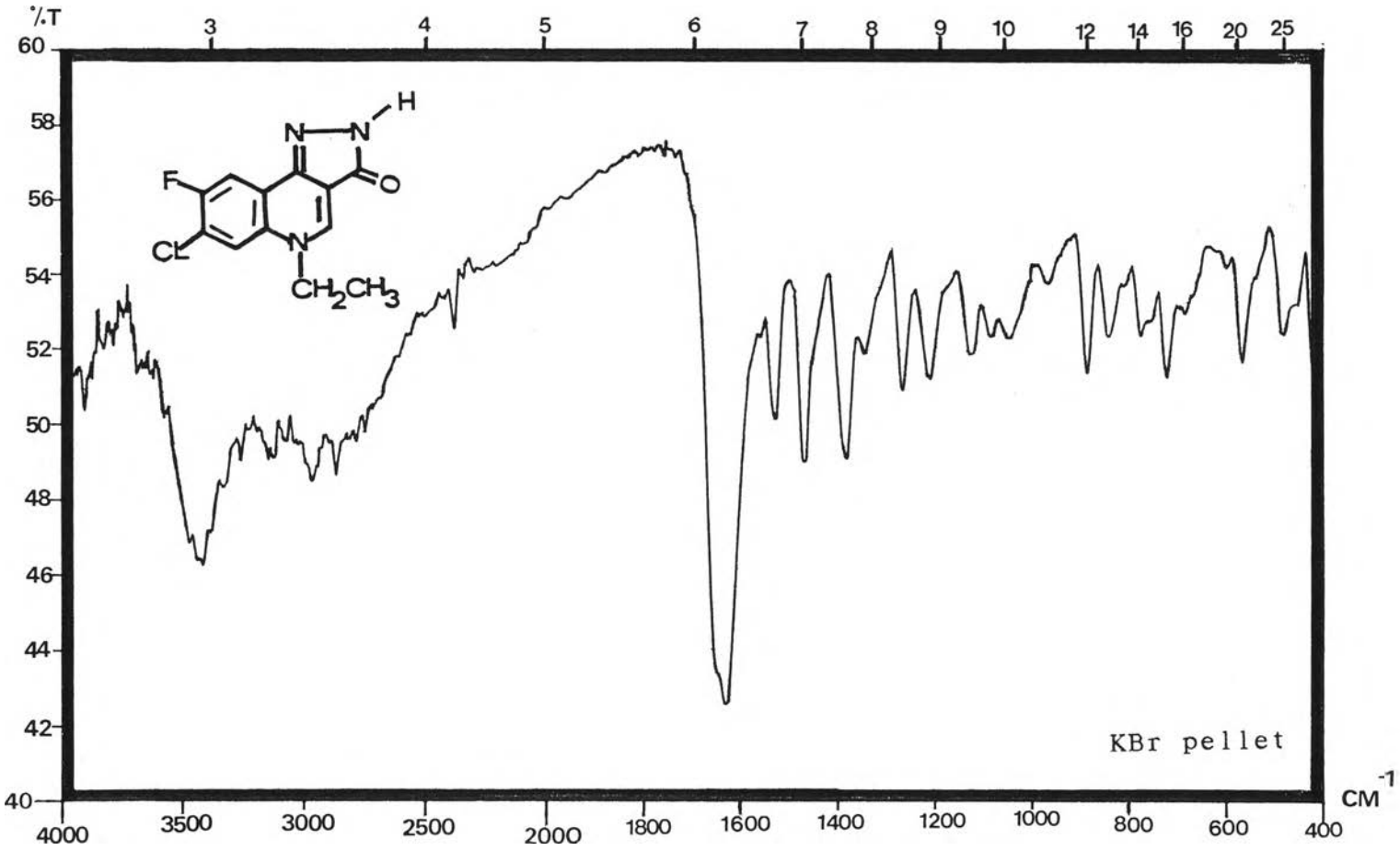


Figure 34 The IR spectrum of 7-Chloro-5-ethyl -8-fluoro-2H-pyrazolo [4,3-c] quinolin-3-one.

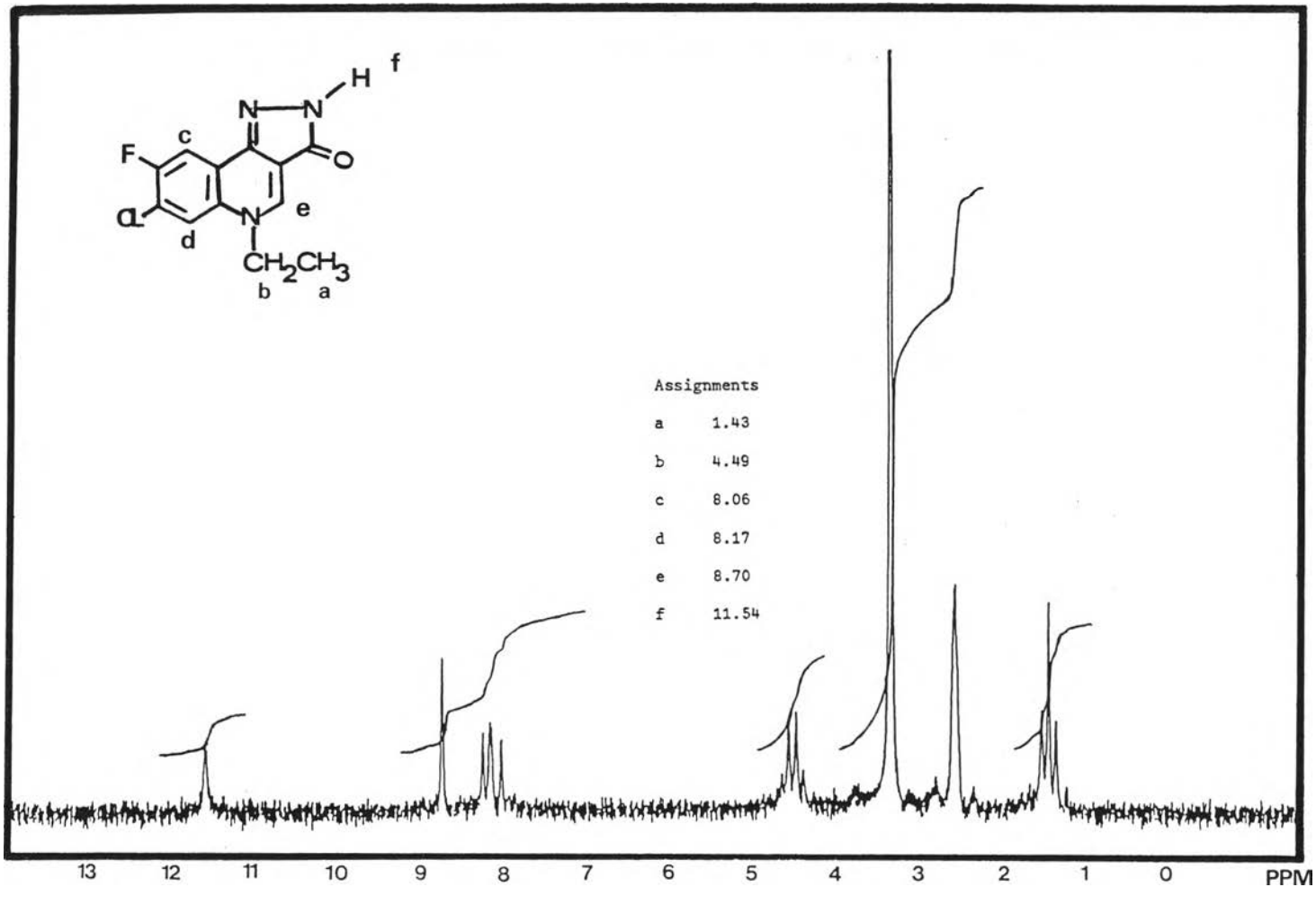


Figure 35 The ^{1}H-NMR spectrum of 7-Chloro -5-ethyl -8-fluoro-2H-pyrazolo [4, 3-c] quinolin- 3-one in DMSO-d_6.

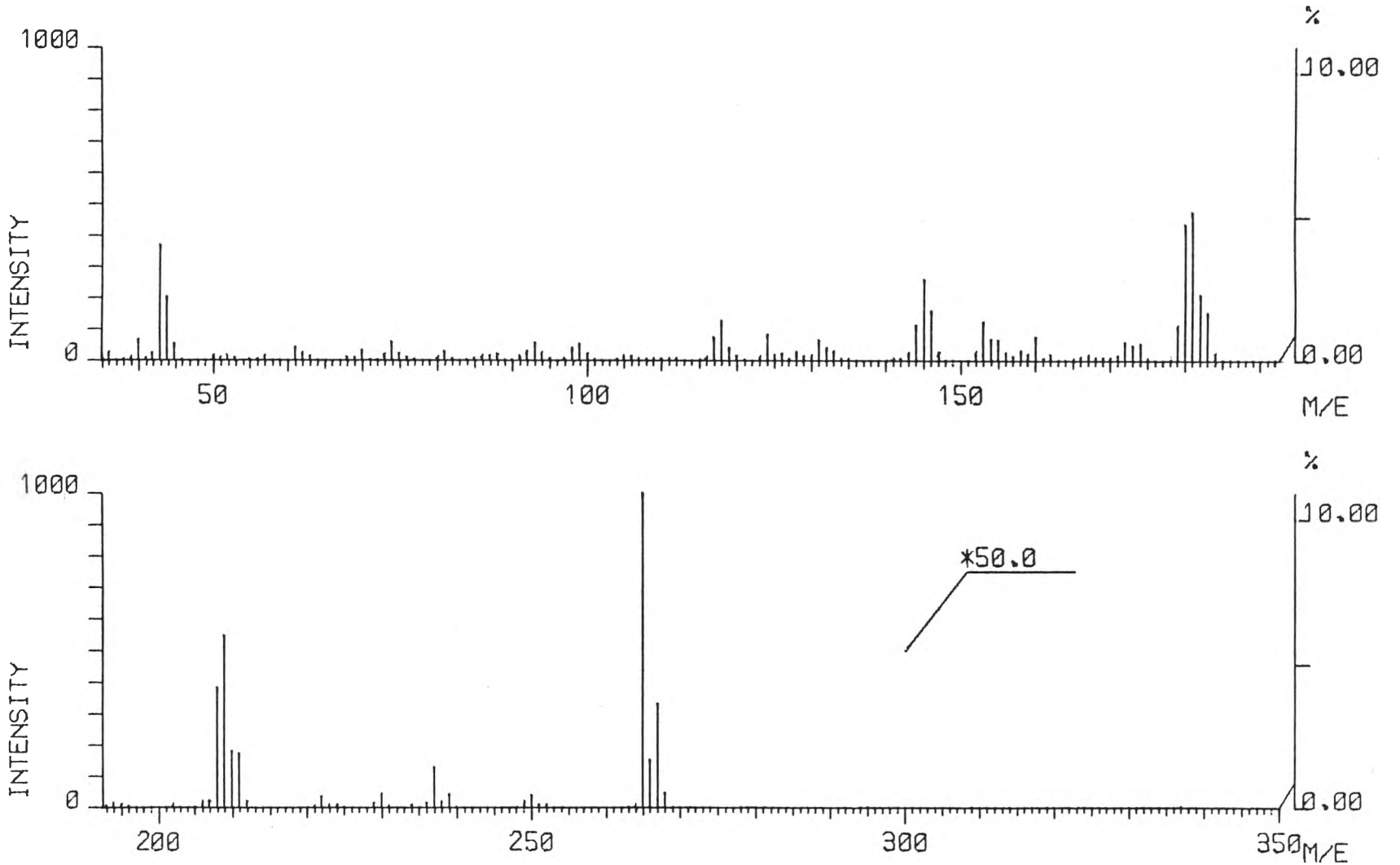


Figure 36 The mass spectrum of 7-Chloro-5-ethyl -8-fluoro -2H-pyrazolo [4,3-c] quinolin -3-one.

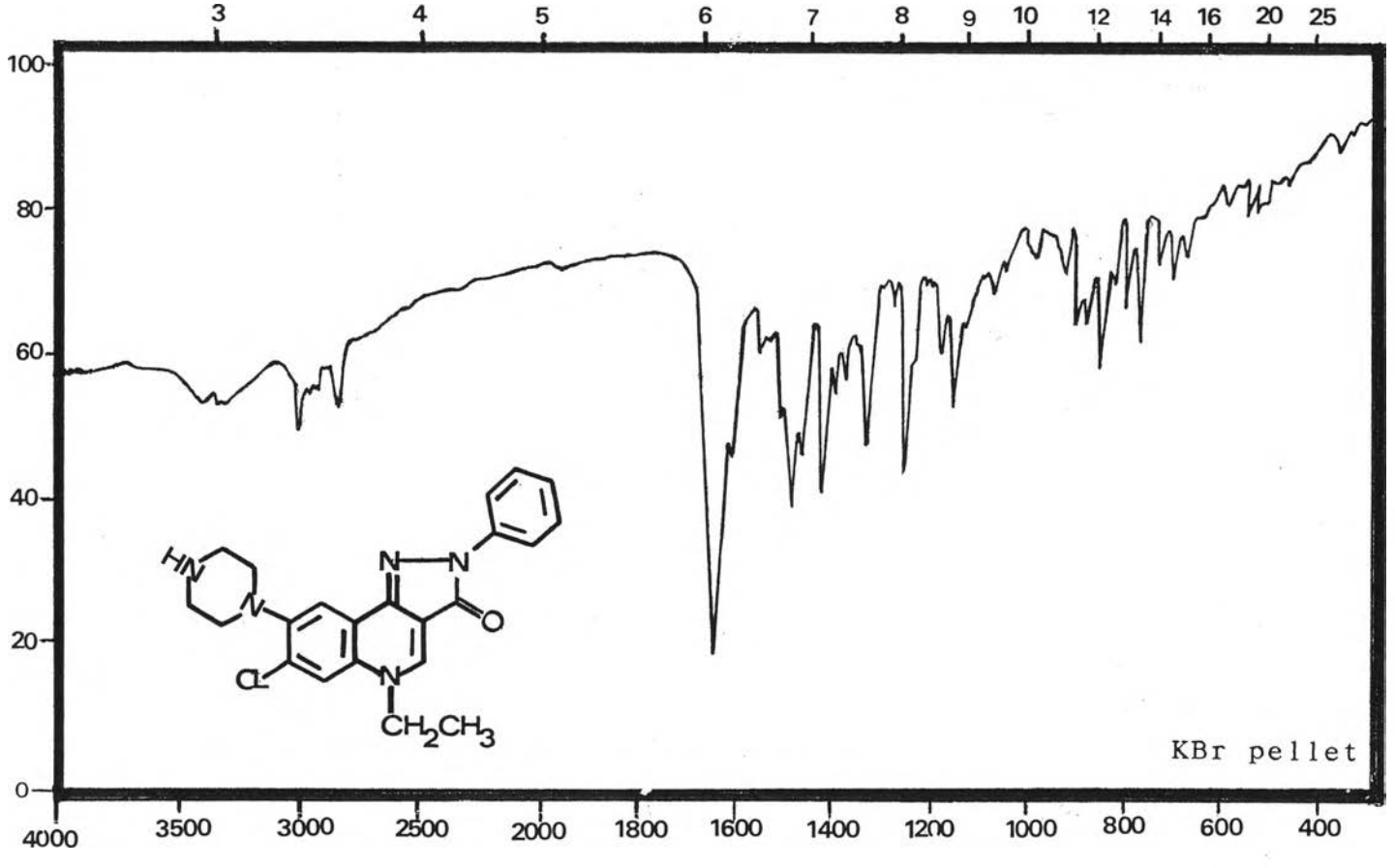


Figure 37 The IR spectrum of 7-Chloro -5-ethyl -8-(1-piperazinyl) -2-arylpyrazolo [4,3-c] quinolin -3-one.

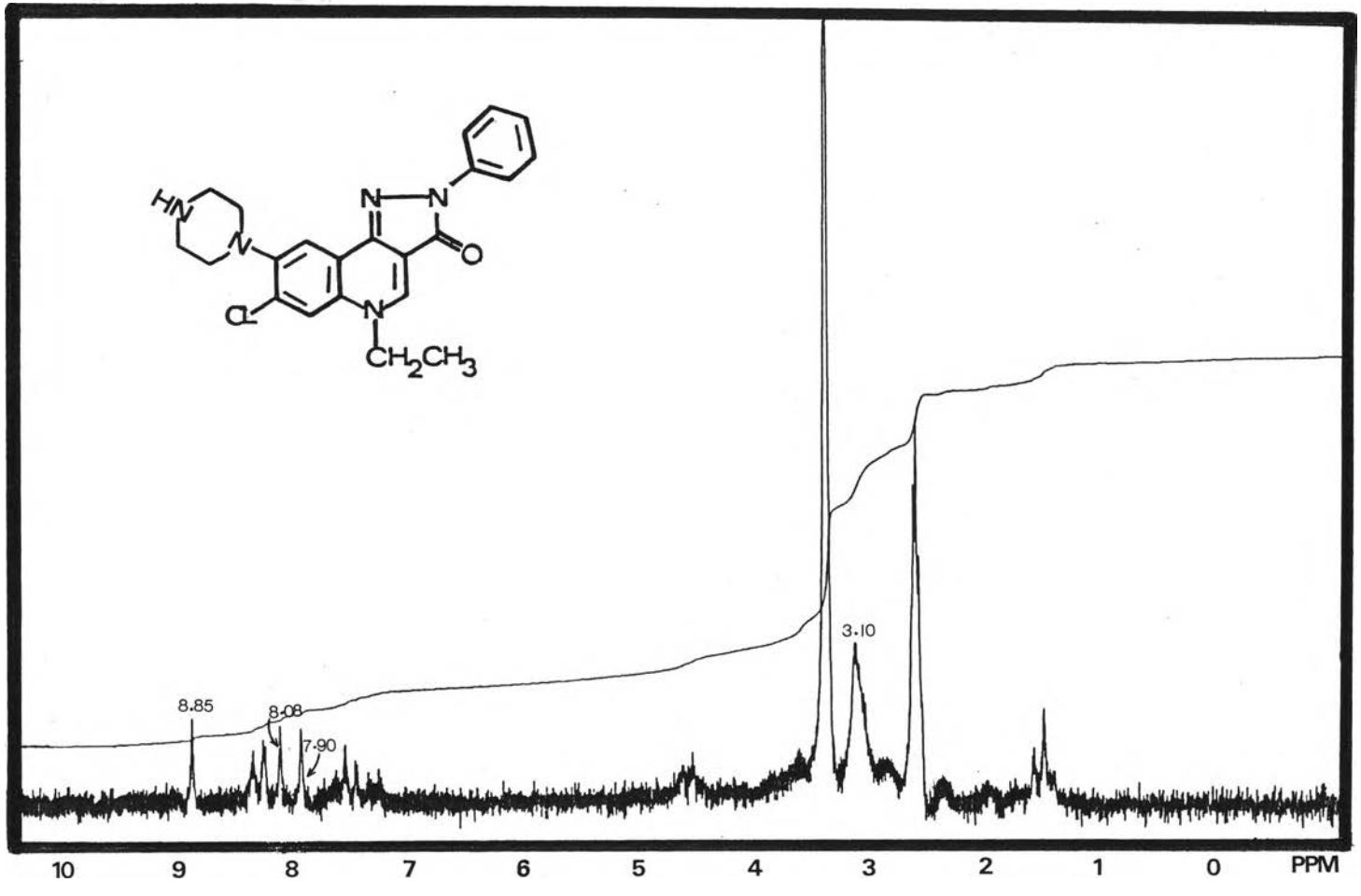


Figure 38 The ^{1}H-NMR spectrum of 7-Chloro-5-ethyl -8-(1-piperazinyl) -2-arylpyrazolo [4,3-c] quinolin -3-one in DMSO-d_6.

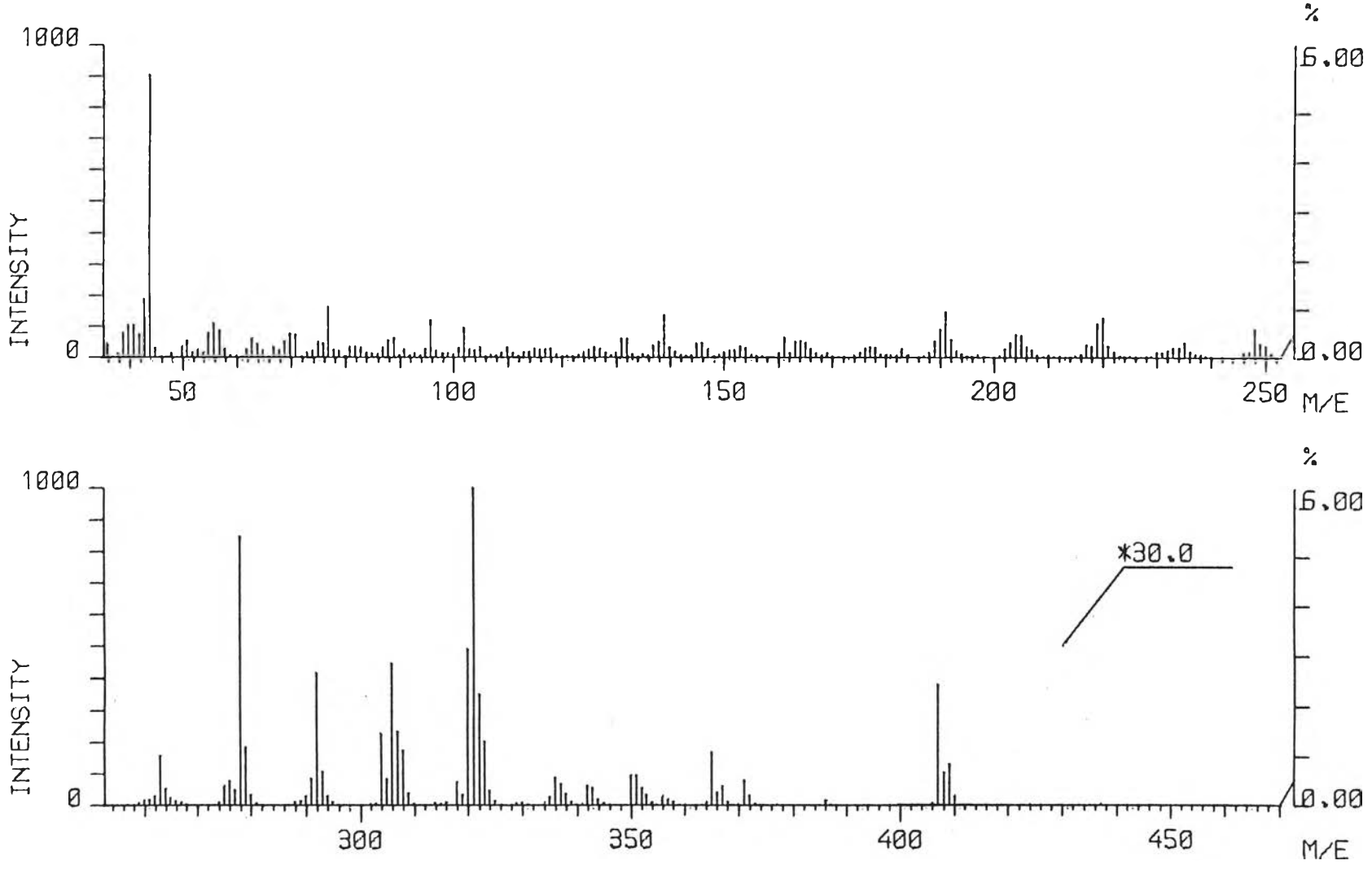


Figure 39 The mass spectrum of 7-Chloro -5-ethyl-8- (1-piperazinyl) -2-arylpyrazolo [4,3-c] quinolin -3-one.

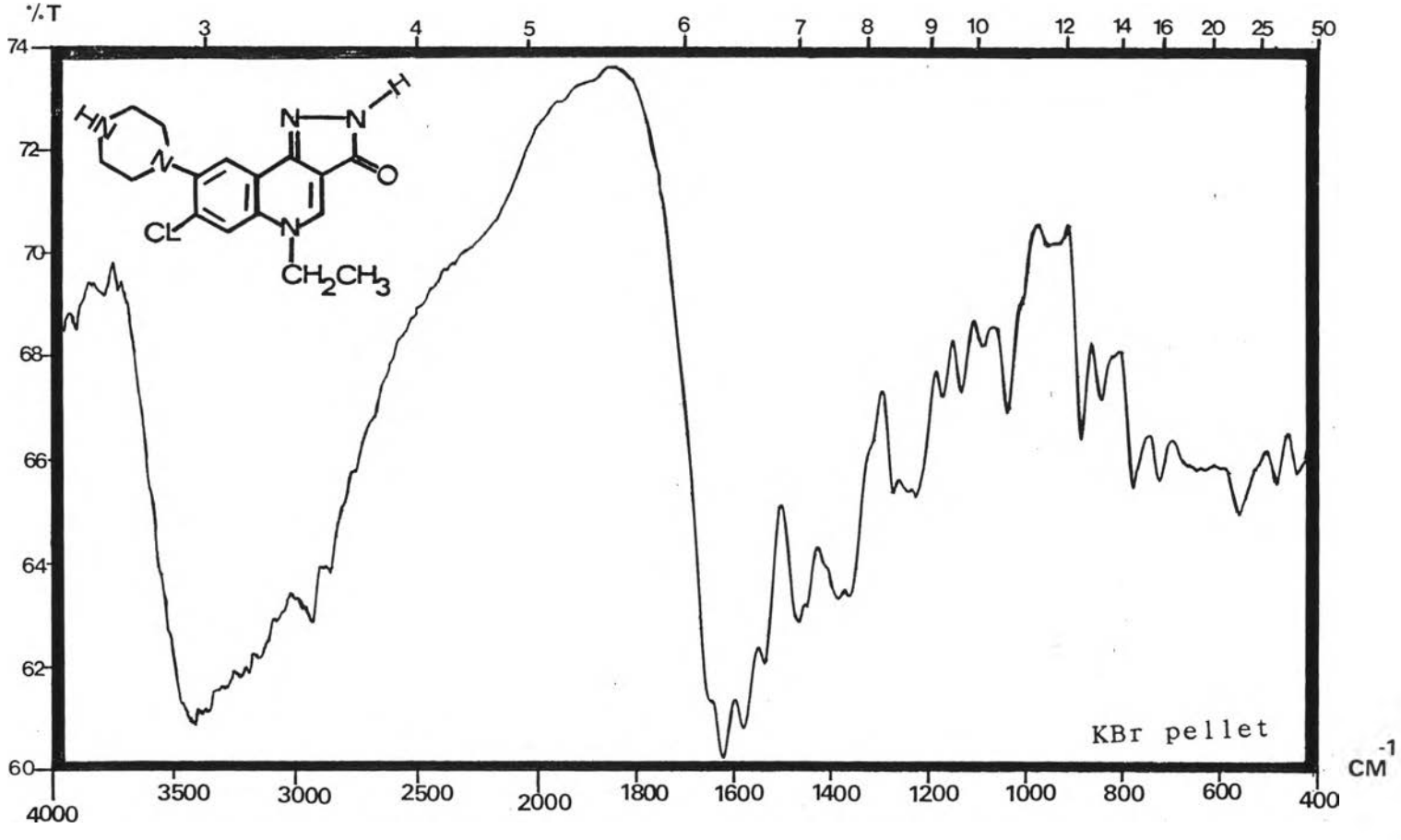


Figure 40 The IR spectrum of 7-Chloro -5-ethyl -8- (1-piperazinyl) -2H-pyrozolo [4,3-c] quinolin -3-one.

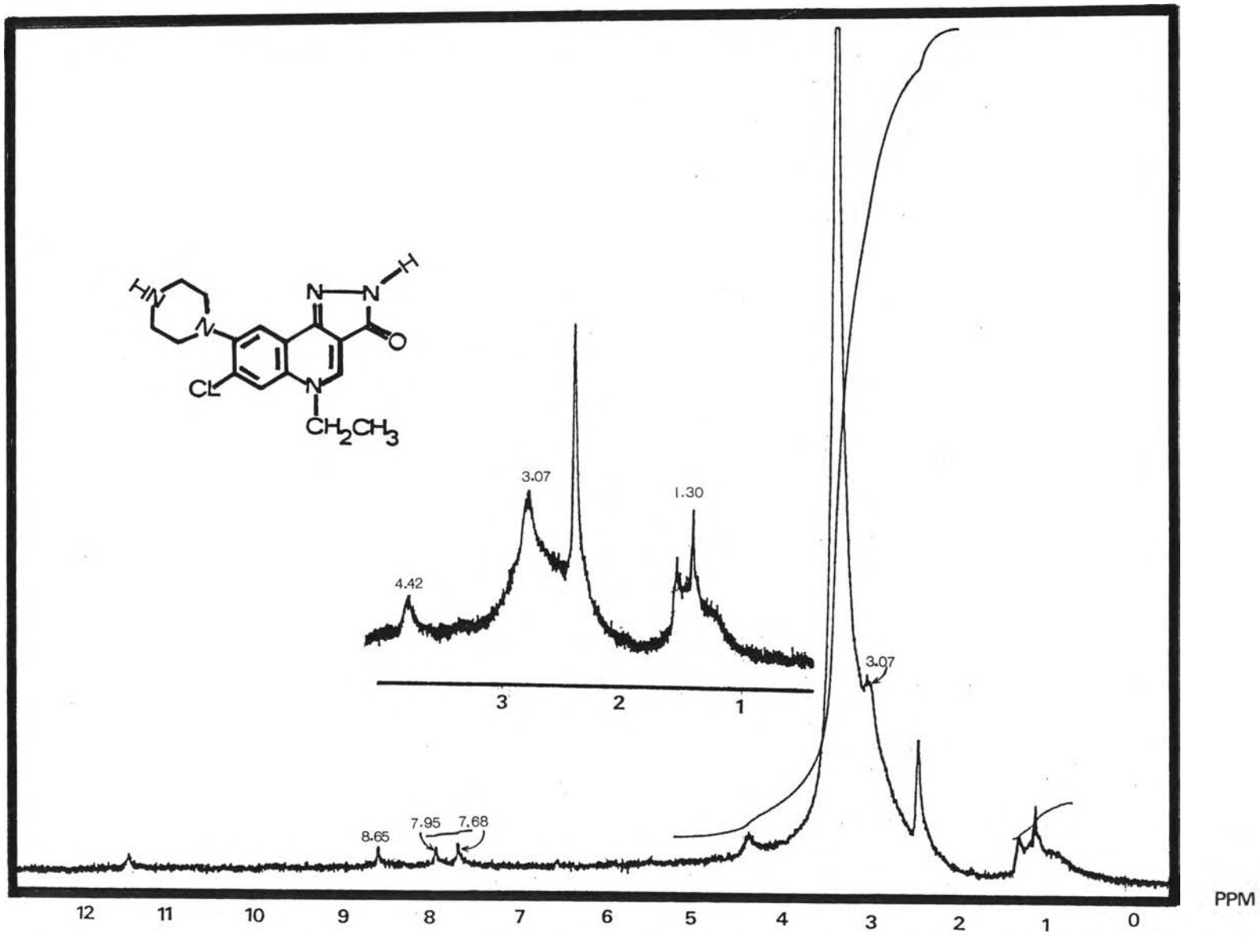


Figure 41 The ^{1}H-NMR spectrum of 7-Chloro-5-ethyl -8- (1-piperazinyl) -2H-pyrazolo [4,3-c] quinolin -3-one in DMSO-d_6.

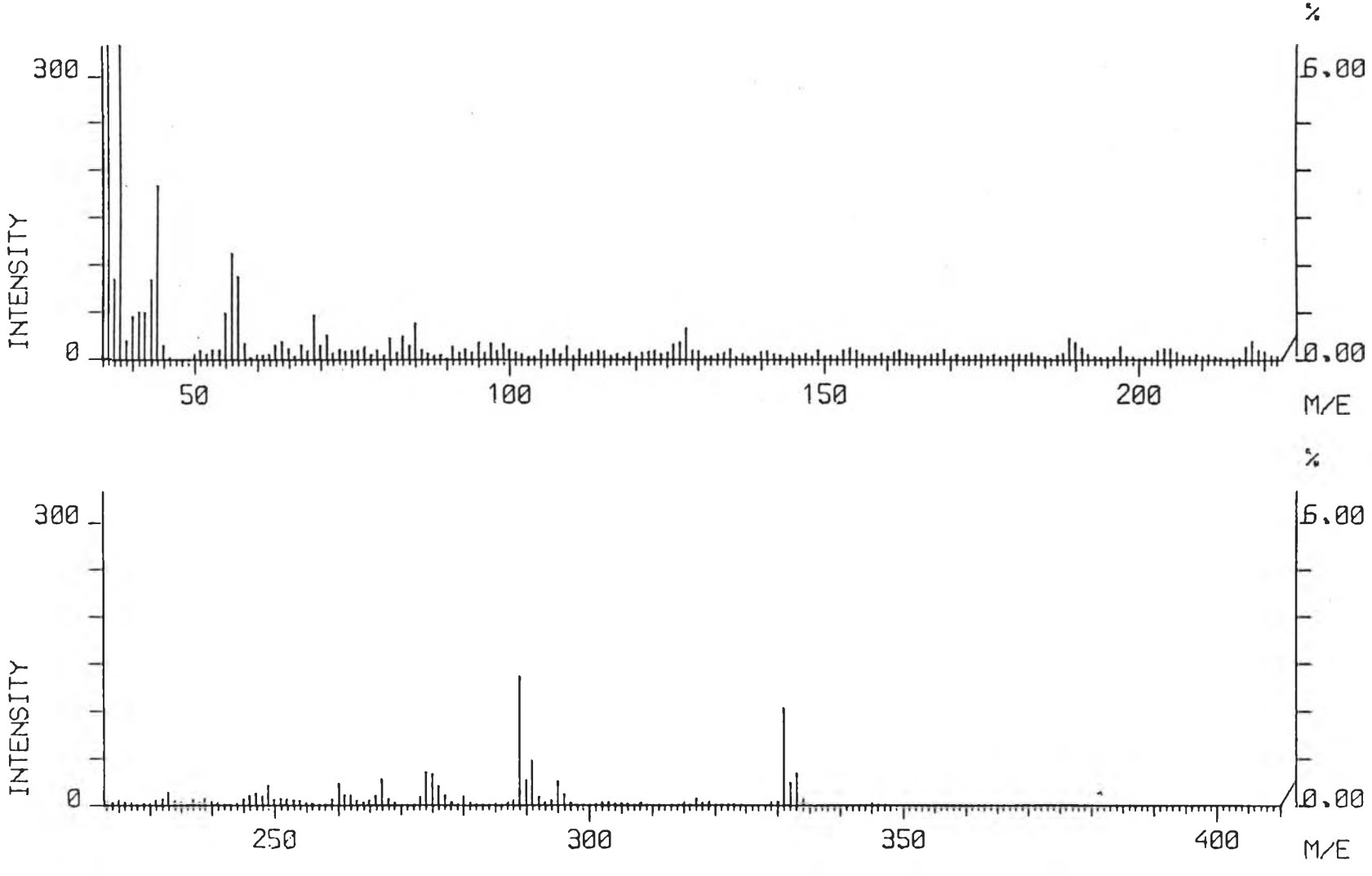


Figure 42 The mass spectrum of 7-Chloro-5-ethyl -8- (1-piperazinyl) -2H-pyrazolo [4,3-c] quinolin -3-one.

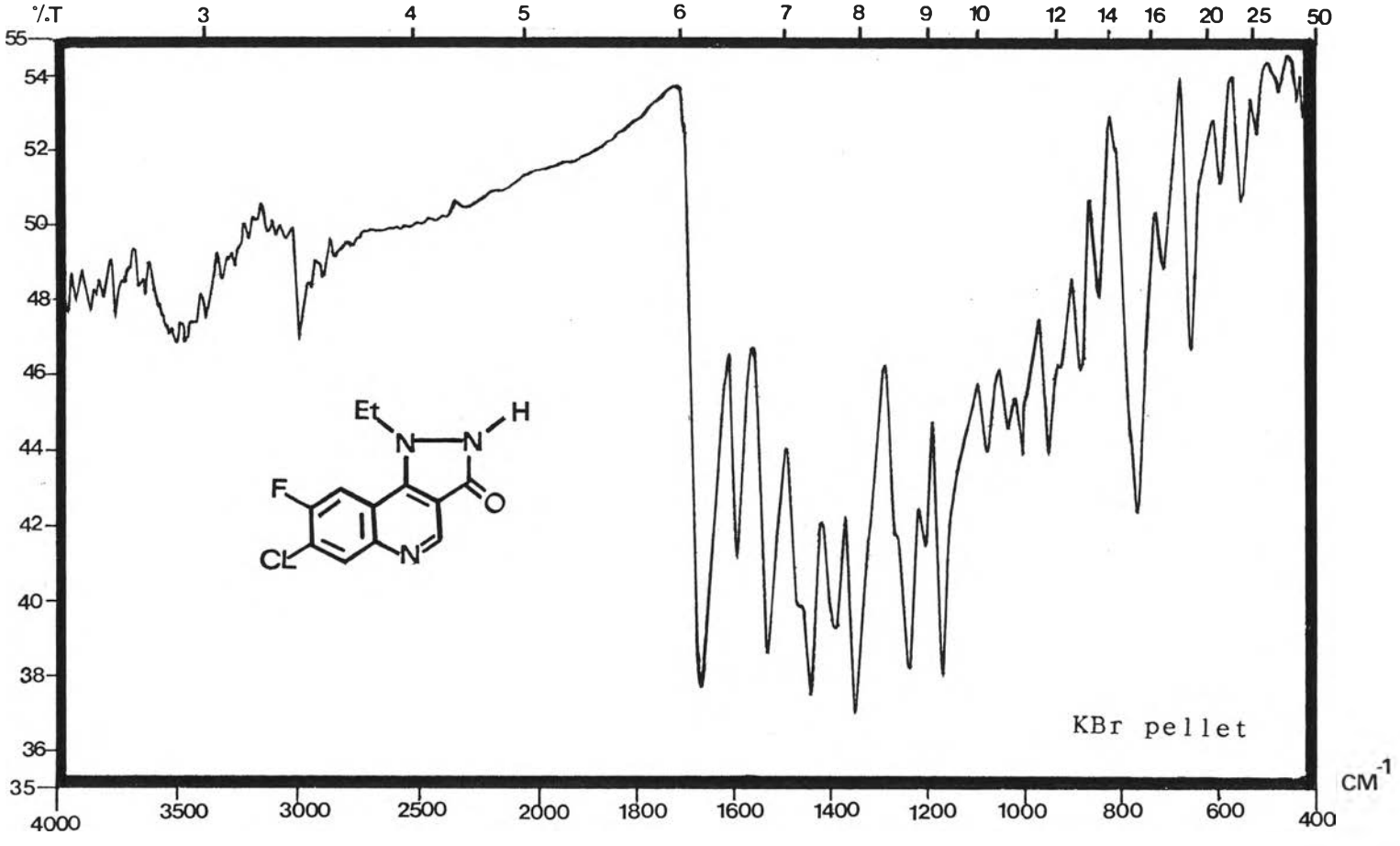


Figure 43 The IR spectrum of 7-Chloro-1-ethyl -8- fluoro -2H-pyrazolo [4,3-c] quinoline.

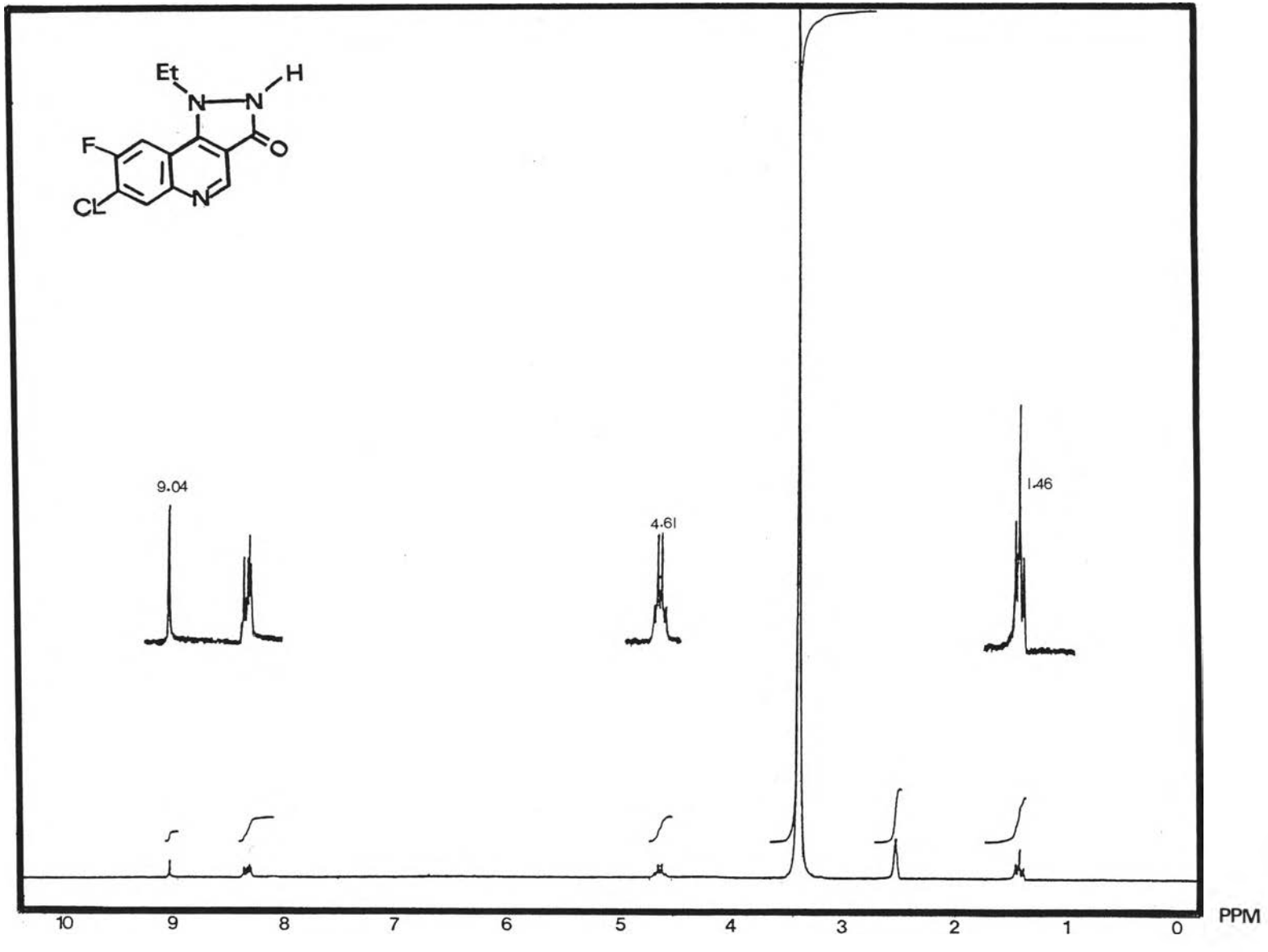


Figure 44 The ^{1}H-NMR spectrum of 7-Chloro-1-ethyl -8-fluoro-2H-pyrazolo [4,3-c] quinolin-3-one in DMSO-d_6.

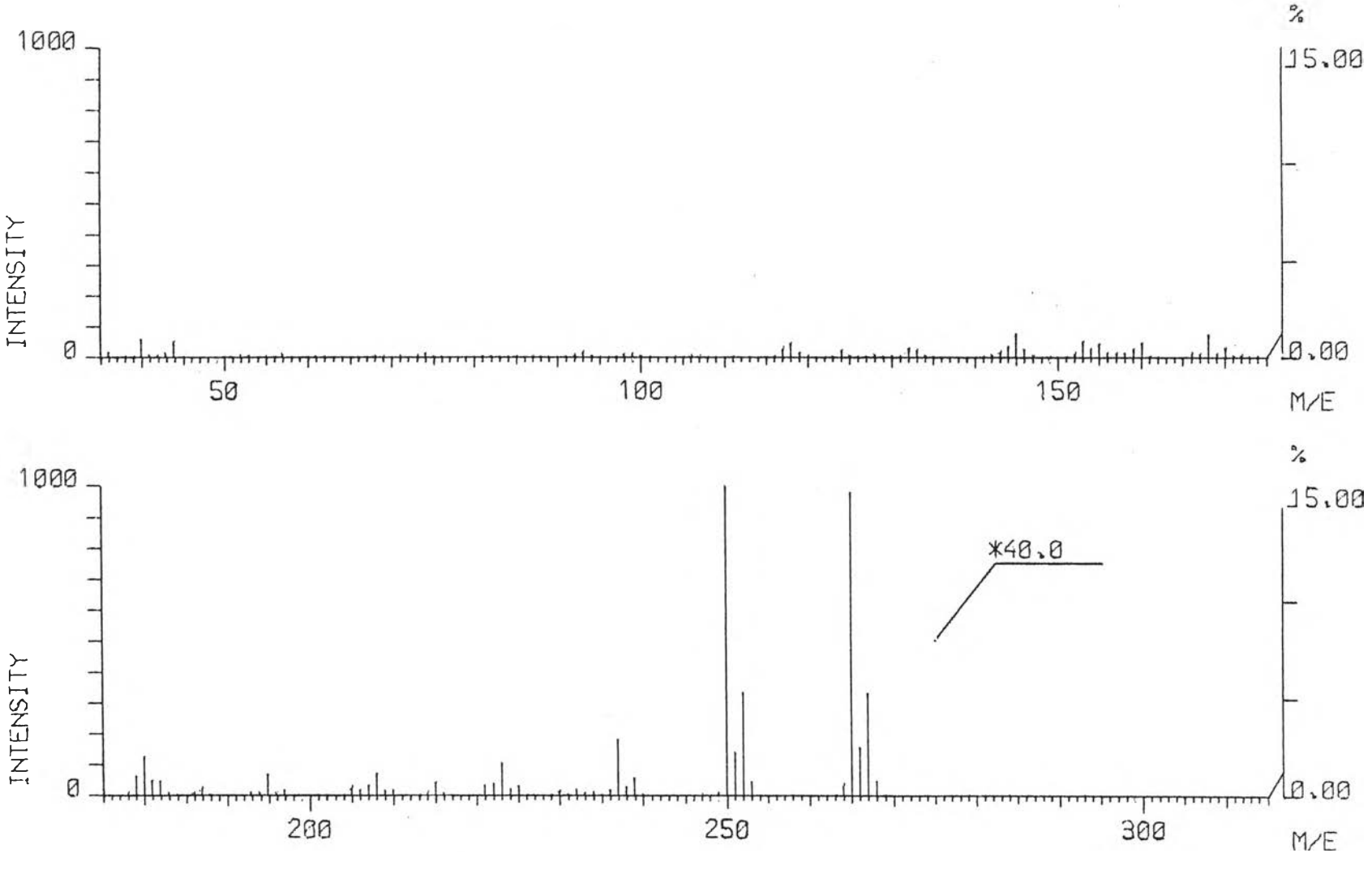


Figure 45 The mass spectrum of 7-Chloro-1- ethyl -8-fluoro -2H-pyrazolo [4,3-c] quinoline.

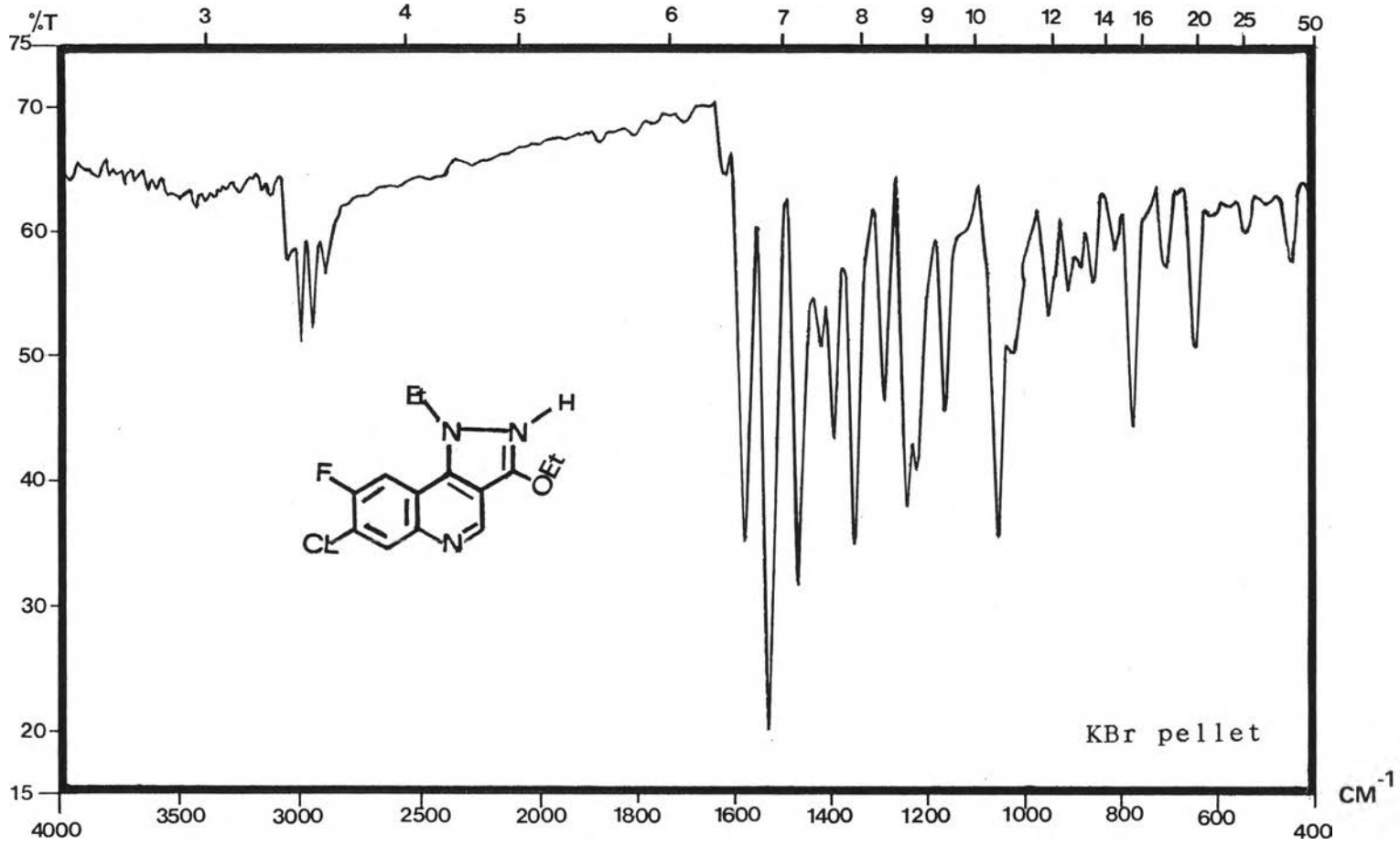


Figure 46 The IR spectrum of 7-Chloro -3- ethoxy -1-ethyl -8-fluoro-pyrazolo [4,3-c] quinoline.

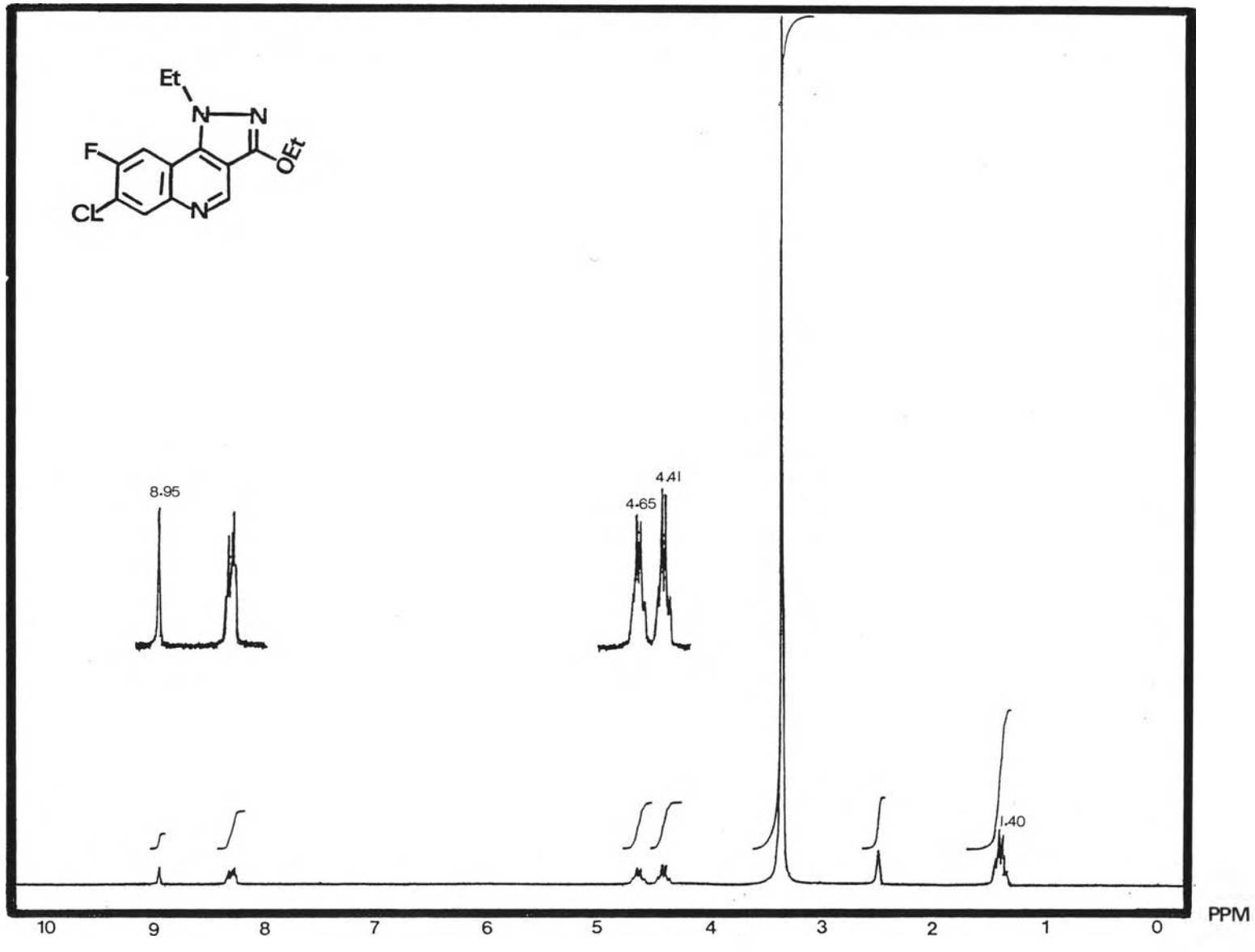


Figure 47 The ^{1}H-NMR spectrum of 7-Chloro-3- ethoxy -1-ethyl -8- fluoro -pyrazolo[4,3-c] quinoline in DMSO-d_6.

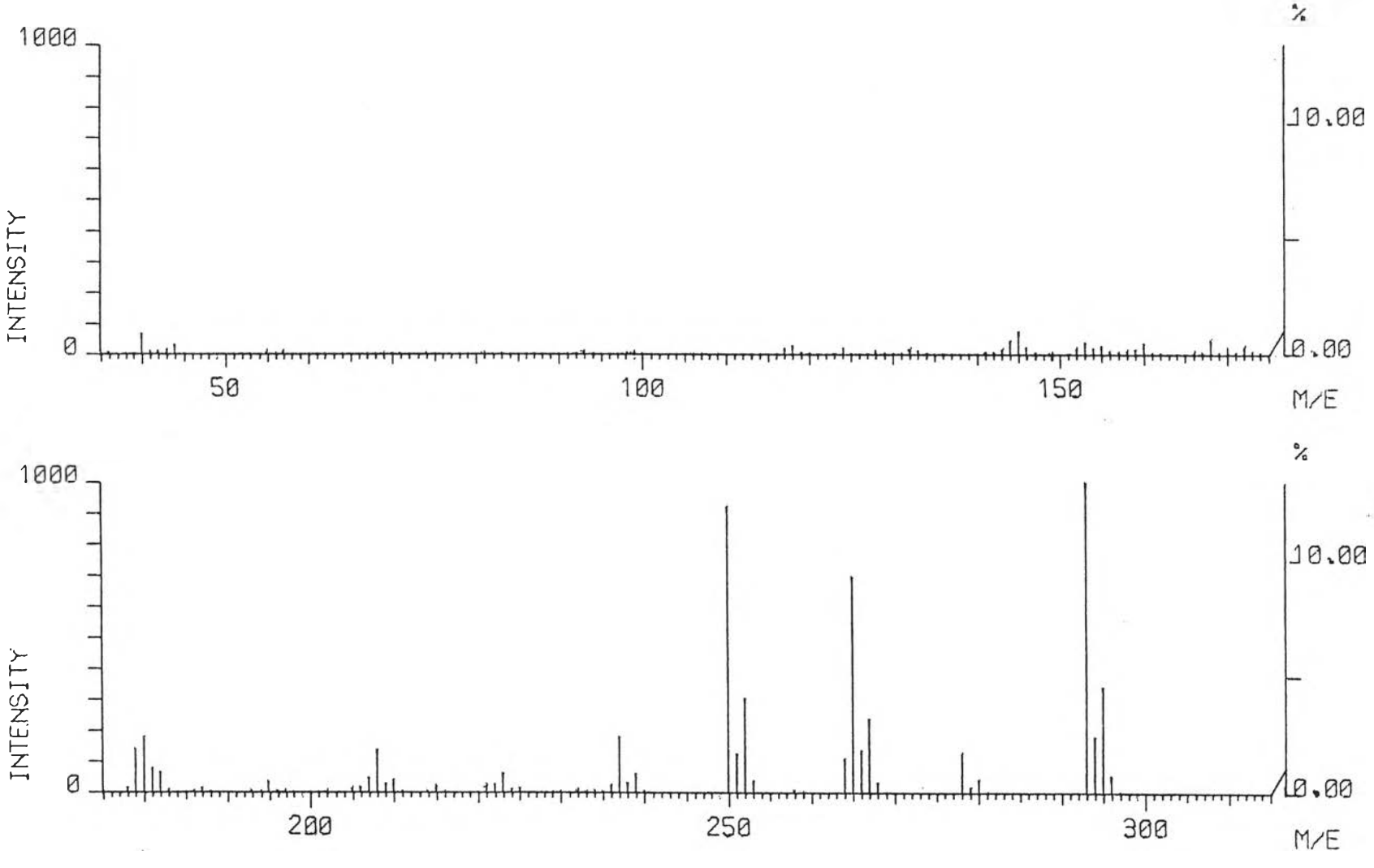


Figure 48 The mass spectrum of 7-Chloro-3- ethoxy-1-ethyl -8-fluoro-pyrazolo [4,3-c] quinoline.

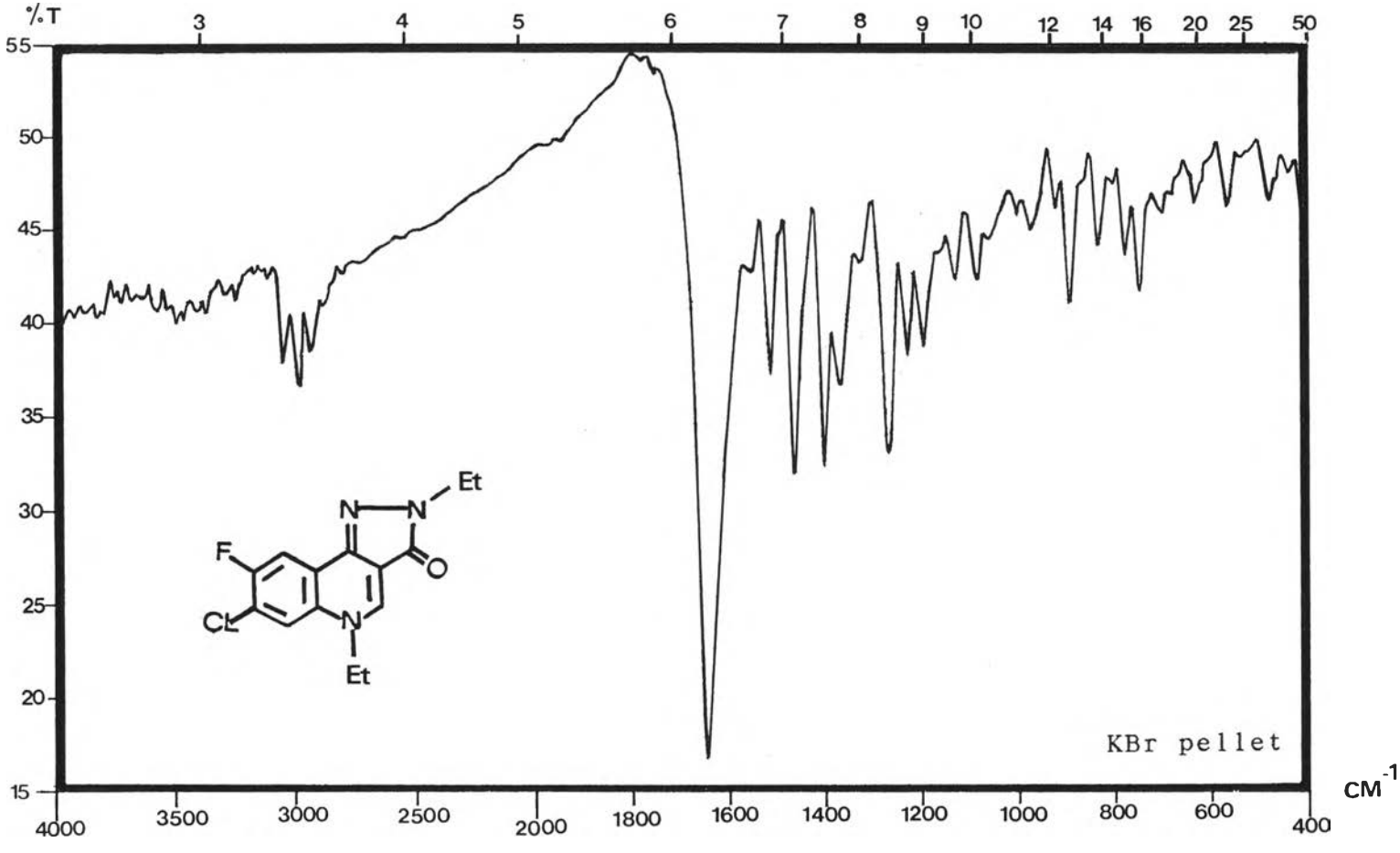


Figure 49 The IR spectrum of 7-Chloro-2, 5-diethyl -8-fluoro - pyrazolo [4,3-c] quinolin -3-one.

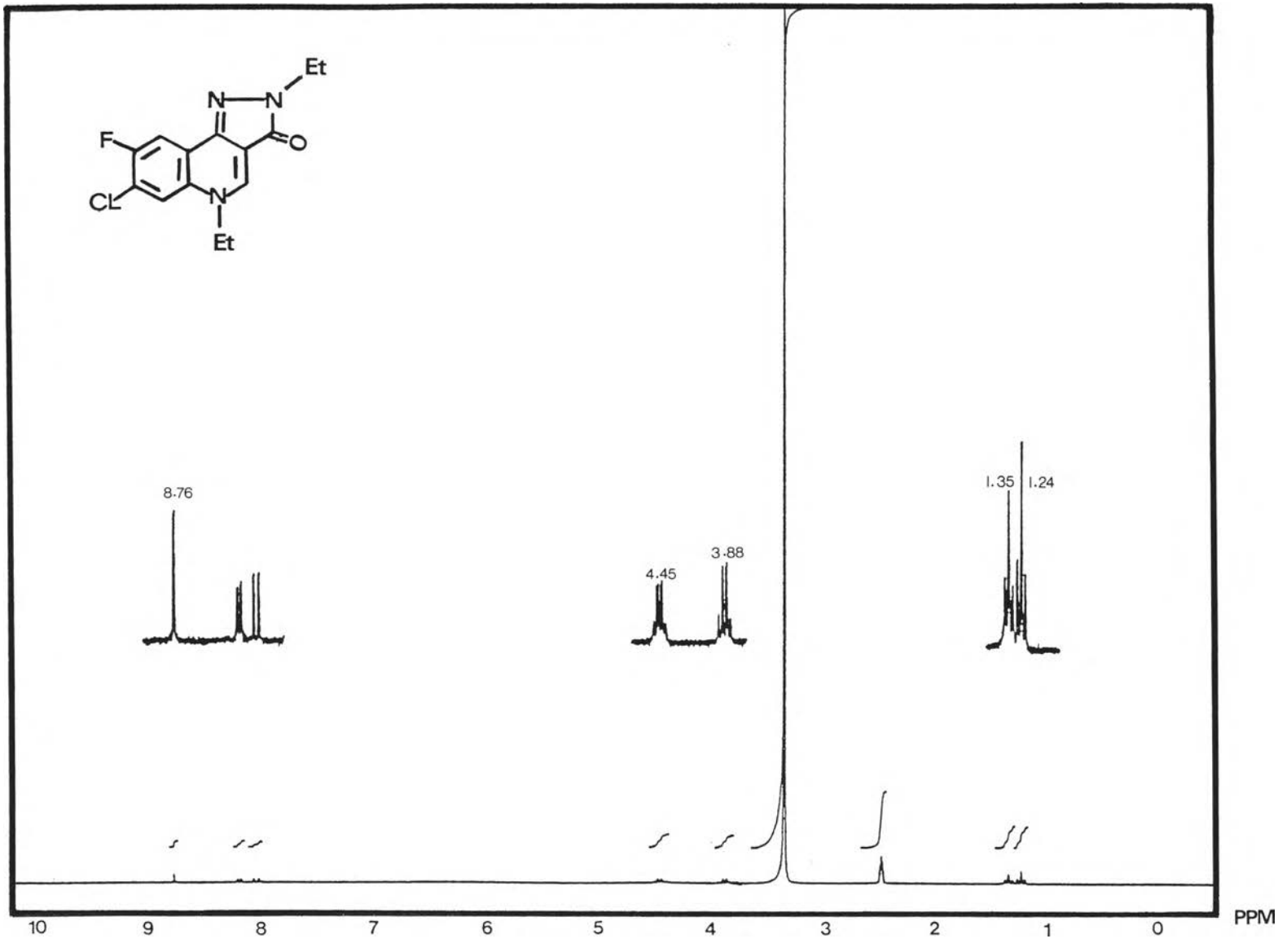


Figure 50 The ^{1}H-NMR spectrum of 7-Chloro-2, 5-diethyl - 8-fluoro - pyrazolo [4,3-c] quinolin -3-one in DMSO-d_6.

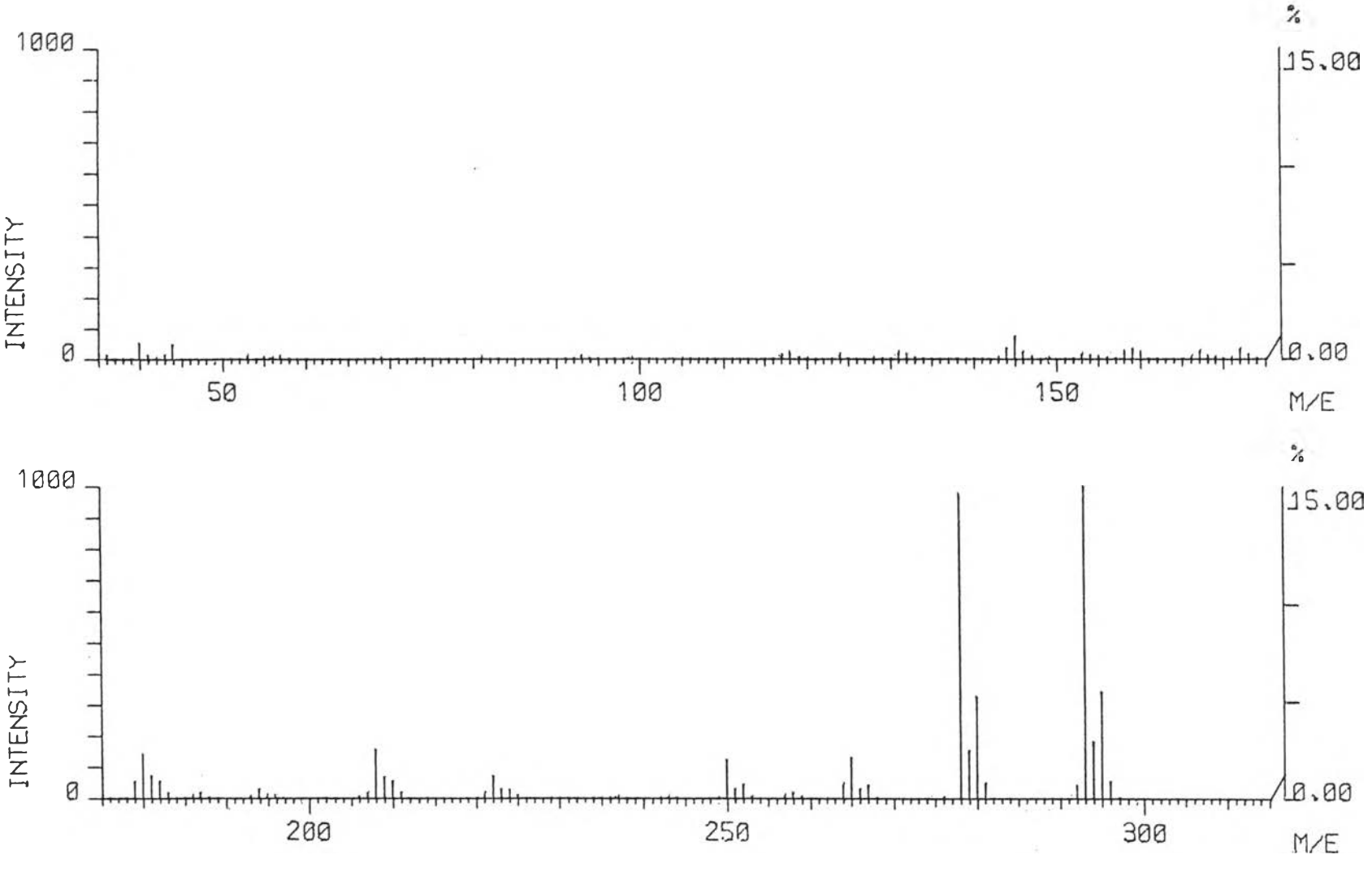


Figure 51 The mass spectrum of 7-Chloro-2, 5-diethyl -8-fluoro - pyrazolo [4,3-c] quinolin -3-one.

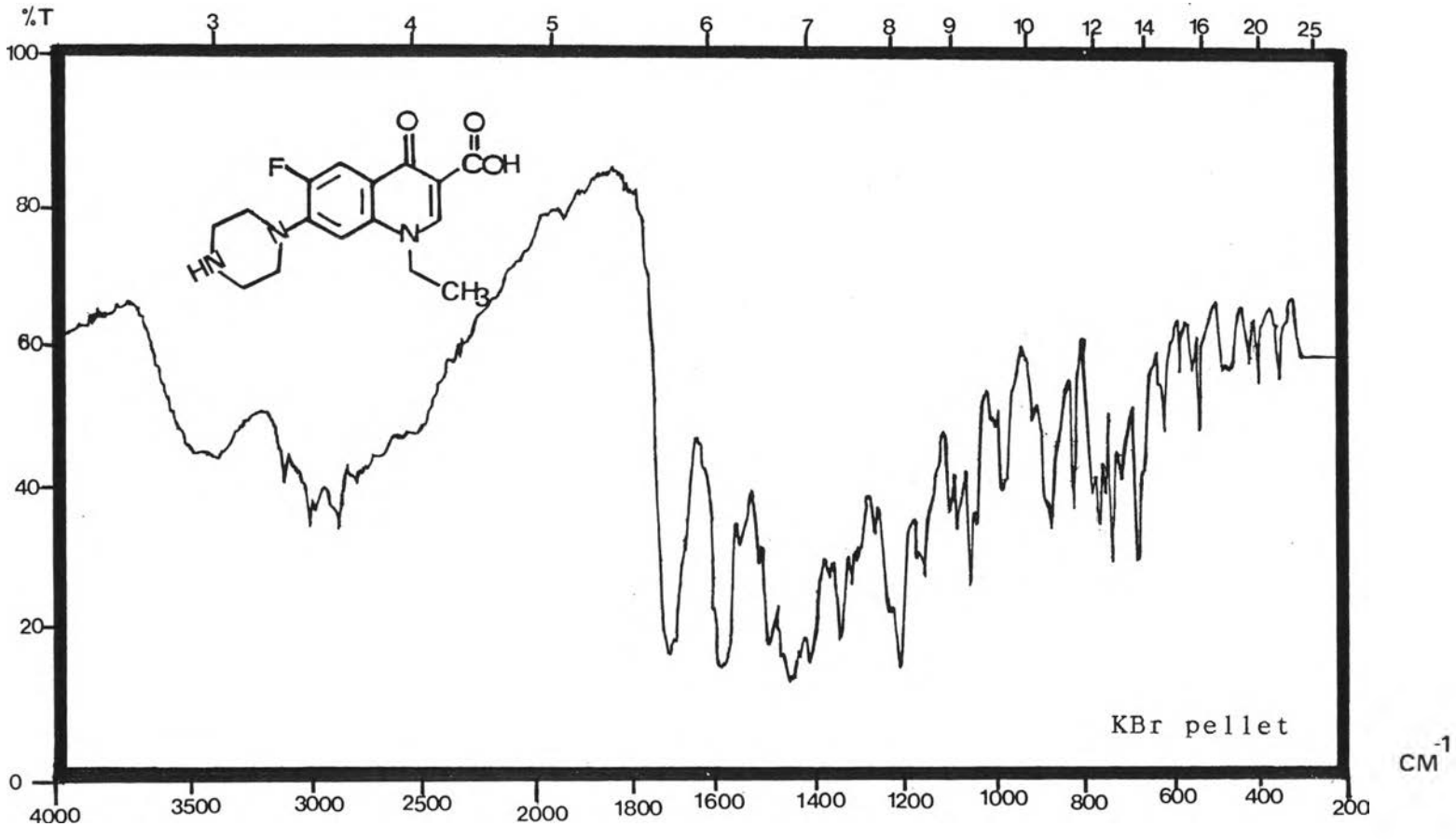


Figure 52 The IR spectrum of norfloxacin standard.

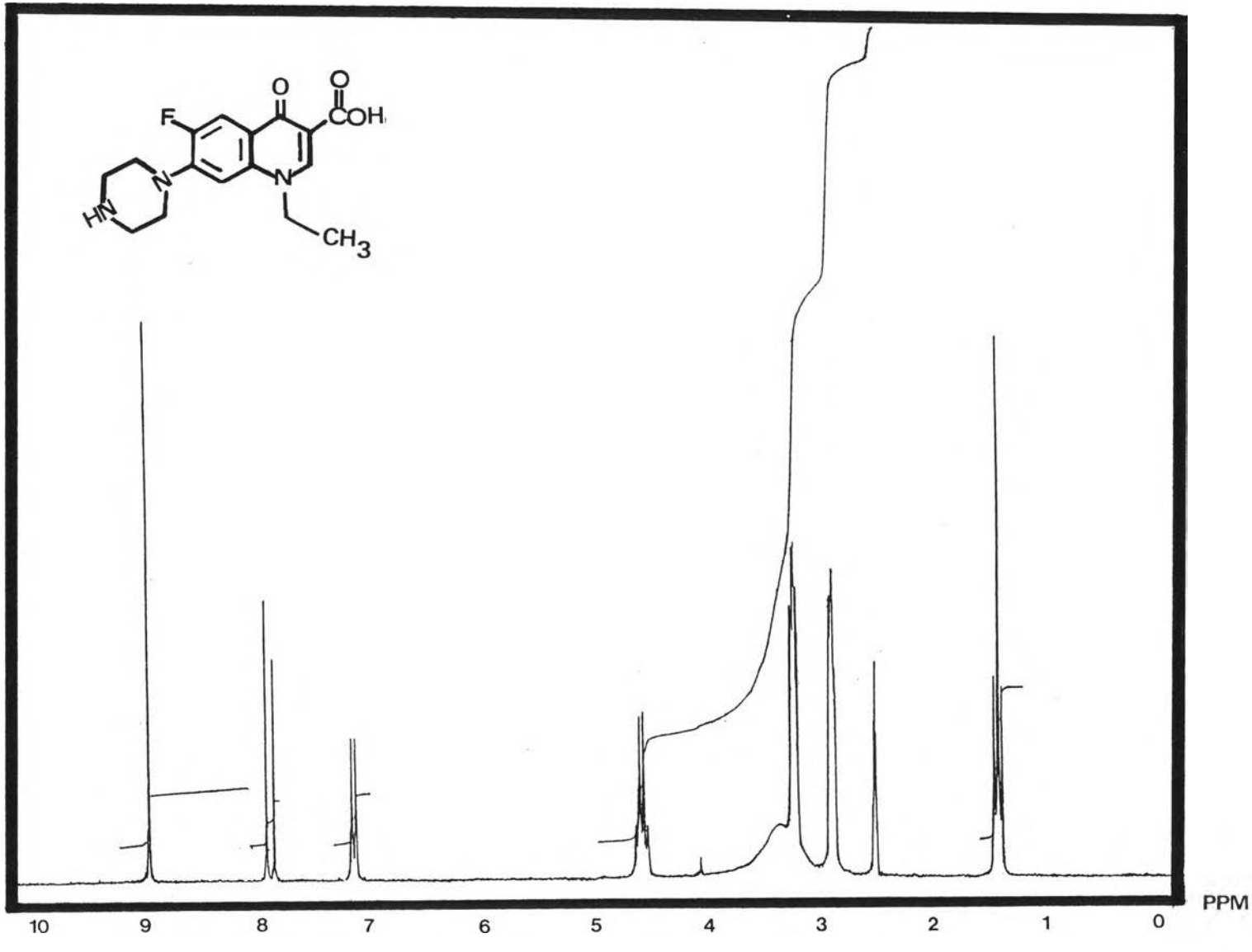


Figure 53 The ^{1}H-NMR spectrum of norfloxacin standard in DMSO-d_6.

VITA

Miss Roongnapa Suedee was born on November 1967, in Nonthaburi, Thailand. She graduated with a Bachelor of Science in Pharmacy from Faculty of Pharmaceutical Science, Chulalongkorn University, Bangkok in 1989.