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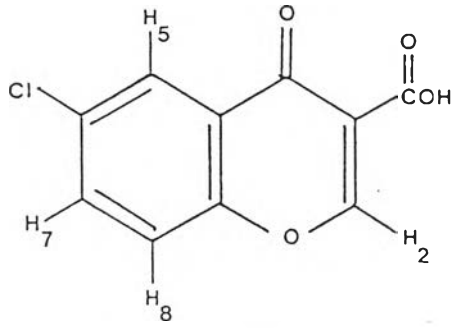
APPENDICES

Table 2 Physicochemical Properties of Chromone-3-carboxylic Acid derivatives.

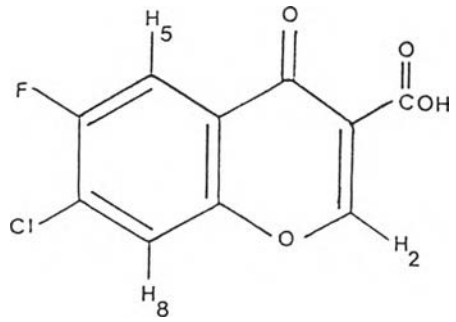
Compounds	Appearance	mp.(^{o}C)	Formular	MW.
I.6-Chlorochromone-3-carboxylic Acid	pale, pink crystal	192-194	$C_9H_5O_4Cl$	224
II.7-Chloro-6-fluorochromone-3-carboxylic Acid	yellow crystal	155	$C_9H_4O_4FCl$	242

Table 3 Spectroscopic Properties of 6-Chlorochromone-3-carboxylic Acid



Position	^{1}H-NMR		IR (cm^{-1})	MS
	Chemical shift(ppm.)	Coupling constant(Hz)		m/e
H_2	9.00	-	2600-3150 (O-H,acid)	
H_5	8.30	$J_{5,7}$=2.5	1770 (C=O,acid)	
H_7	7.75	$J_{5,7}$=2.5	1650 (C=O,pyrone)	224
		$J_{7,8}$=9.0	1140 (O=C-OH)	
H_8	7.50	$J_{7,8}$=9.0		

Table 4 Spectroscopic Properties of 7-Chloro-6-fluorochromone-3-carboxylic Acid.



Position	^{1}H-NMR		IR (cm^{-1})	MS
	Chemical shift(ppm.)	Coupling constant(Hz)		m/e
O-H	12.96	-	2700 (O-H,acid)	
H_2	8.96	-	1760 (C=O,acid)	242
H_5	8.00	J_{H5-F}=8.0	1610 (C=O,pyrone)	
H_8	7.74	J_{H8-F}=6.0		

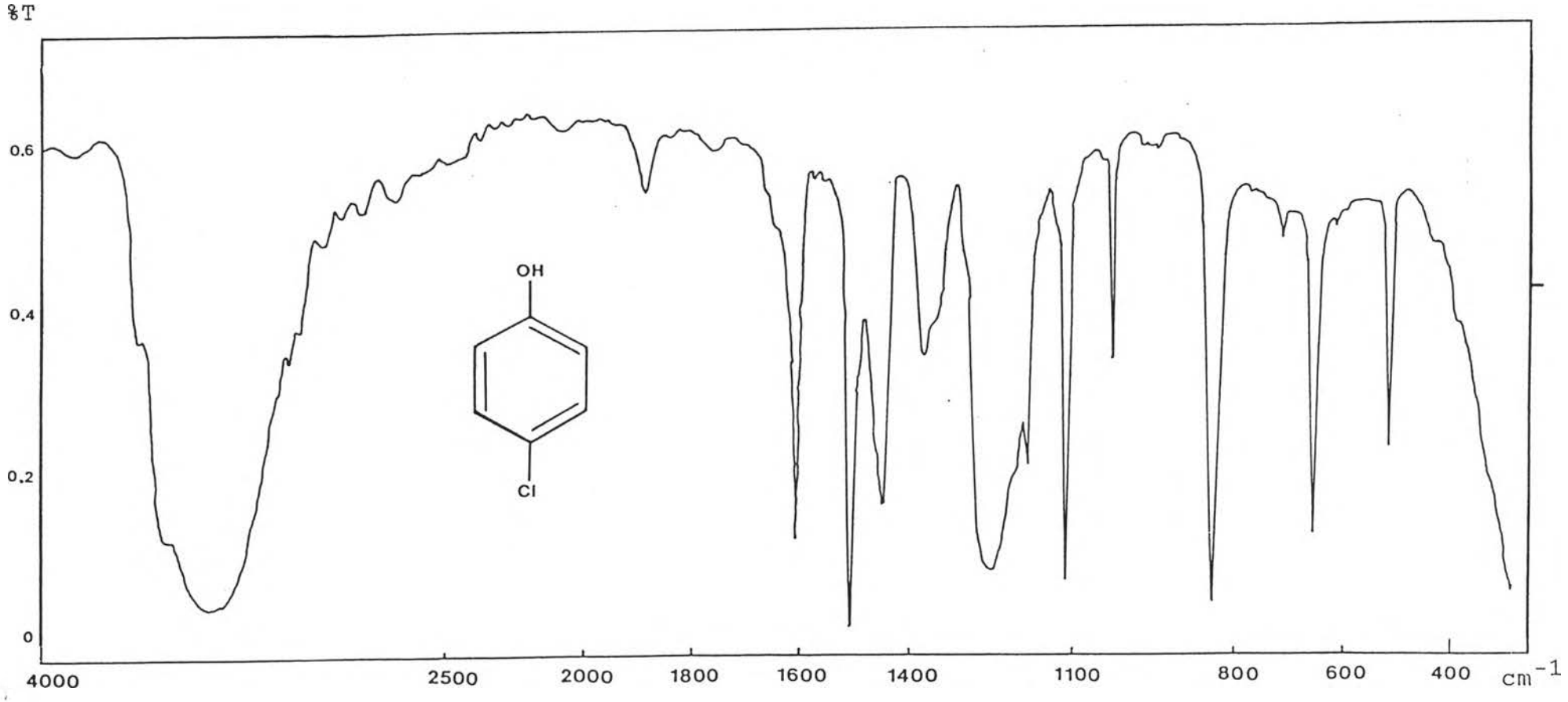


Figure 9 The IR spectrum of 4-Chlorophenol

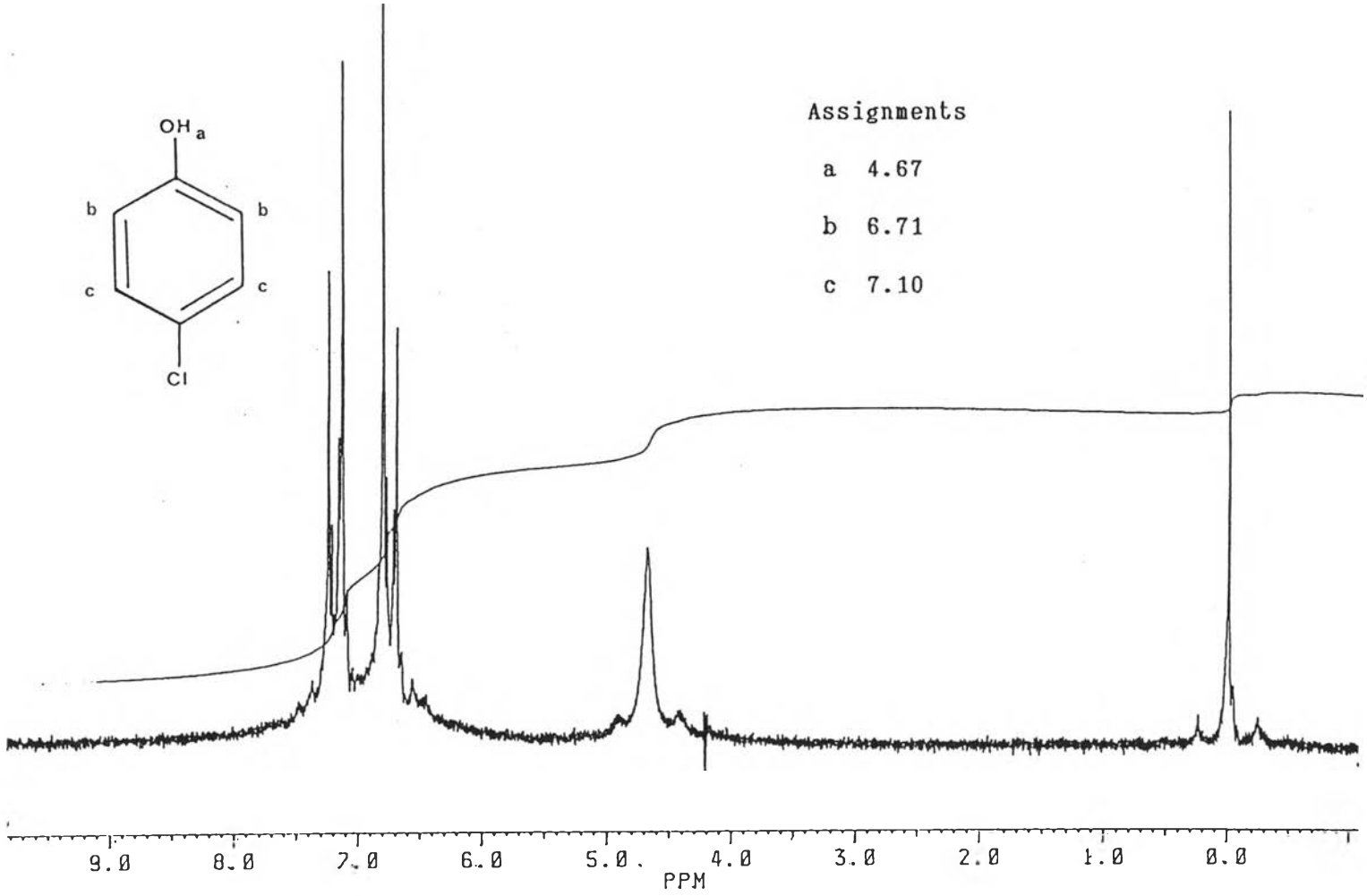


Figure 10 The ^{1}H-NMR spectrum of 4-Chloro-phenol in $CDCl_3$

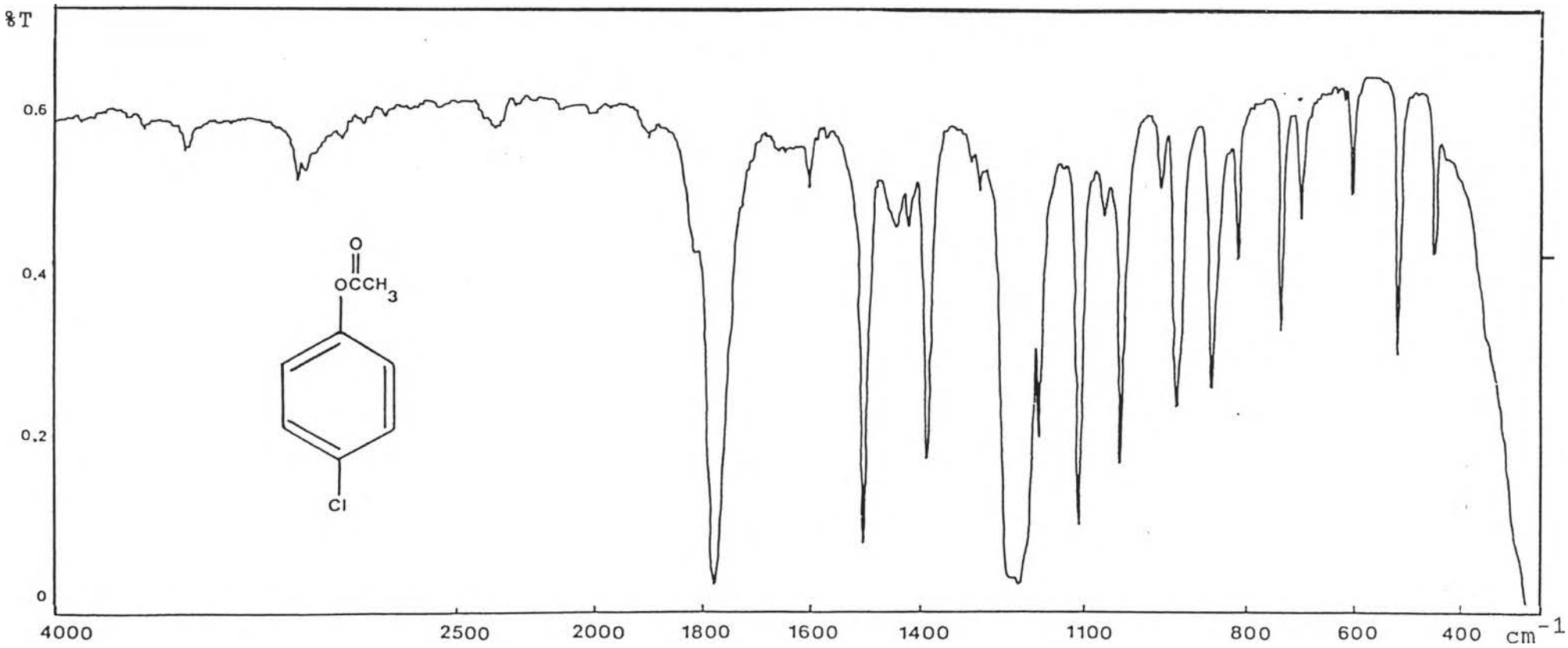


Figure 11 The IR spectrum of 4-Chlorophenyl acetate

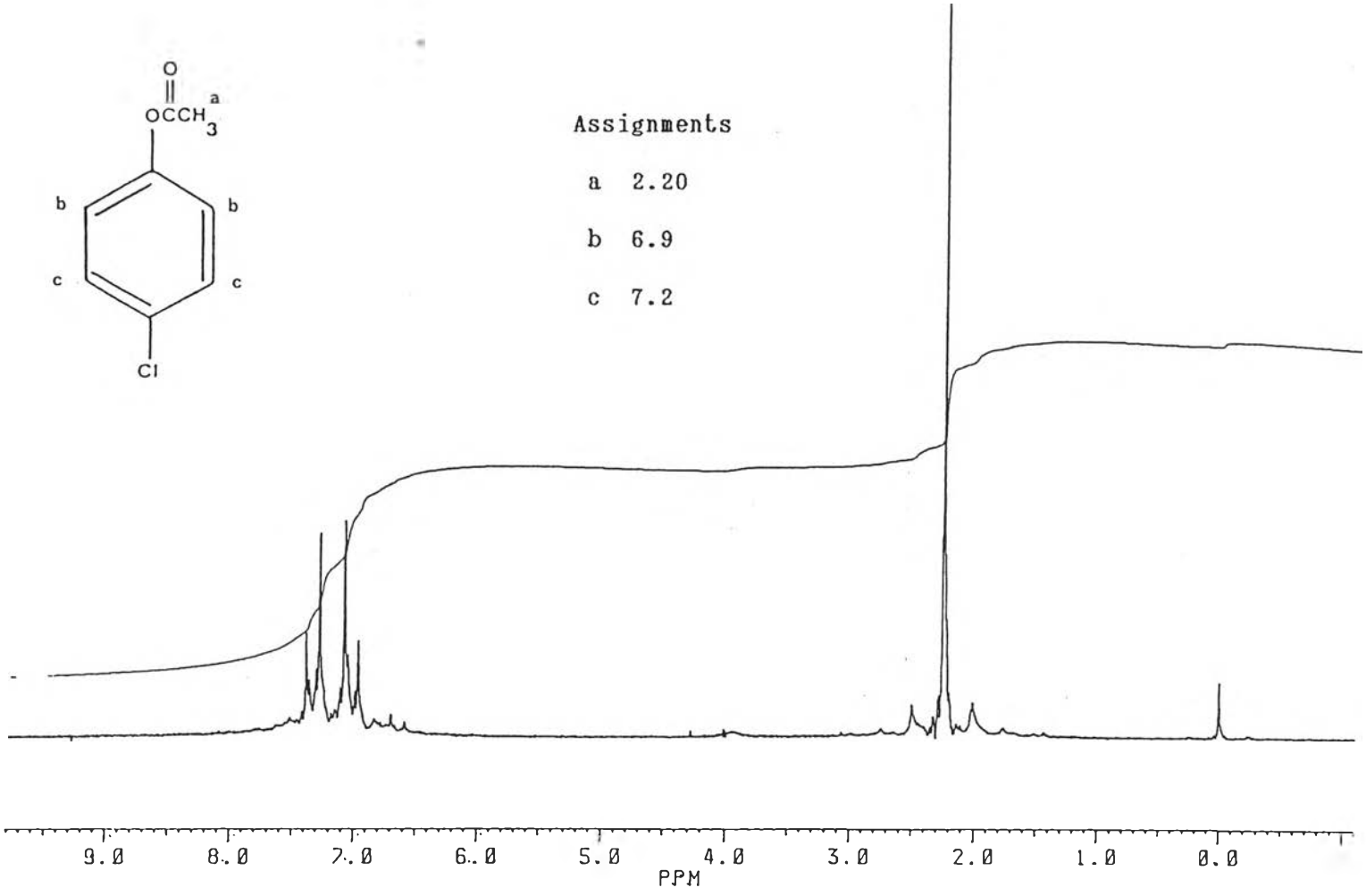


Figure 12 The ^{1}H-NMR spectrum of 4-Chlorophenyl acetate in $CDCl_3$

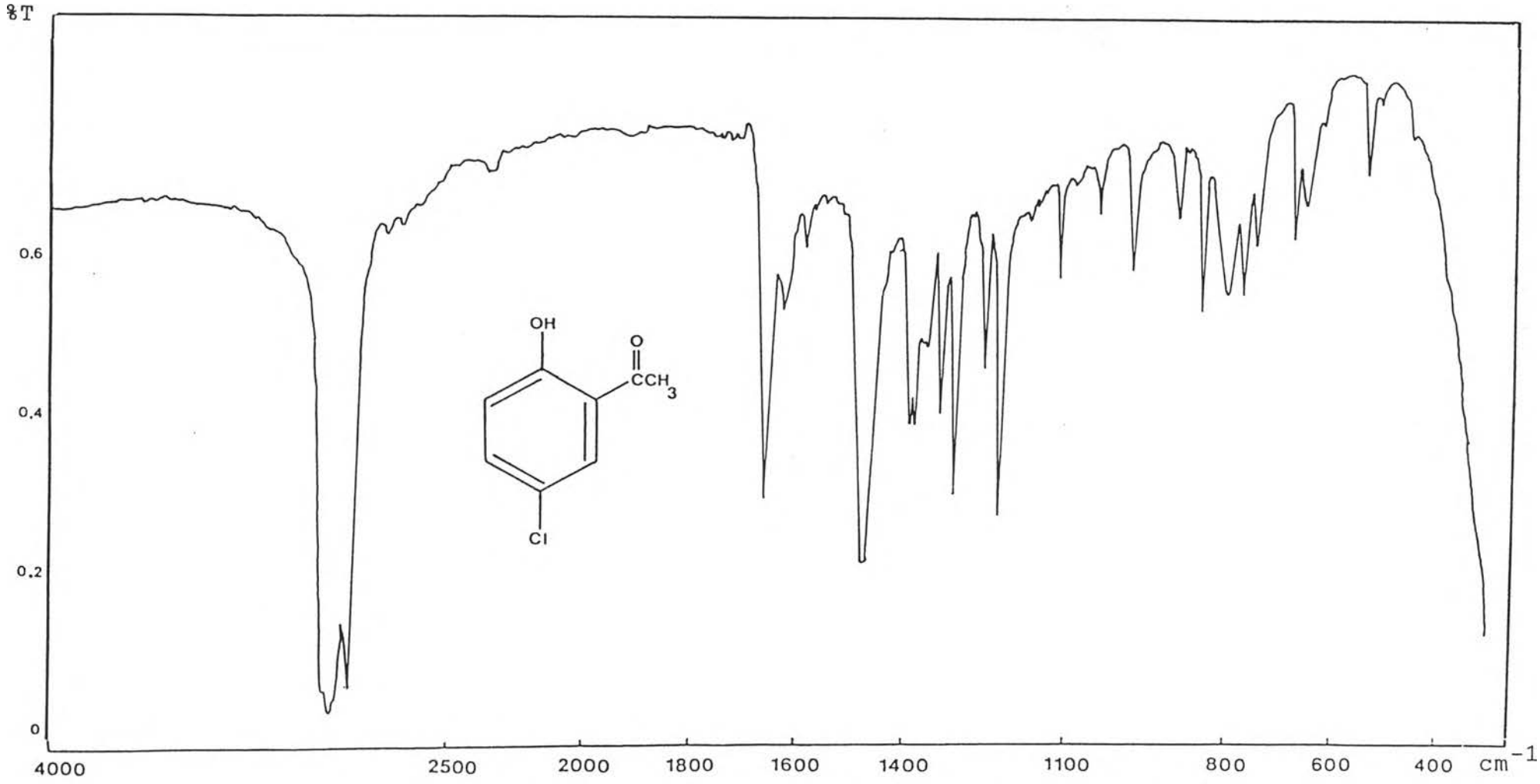


Figure 13 The IR spectrum of 5-Chloro-2-hydroxy acetophenone

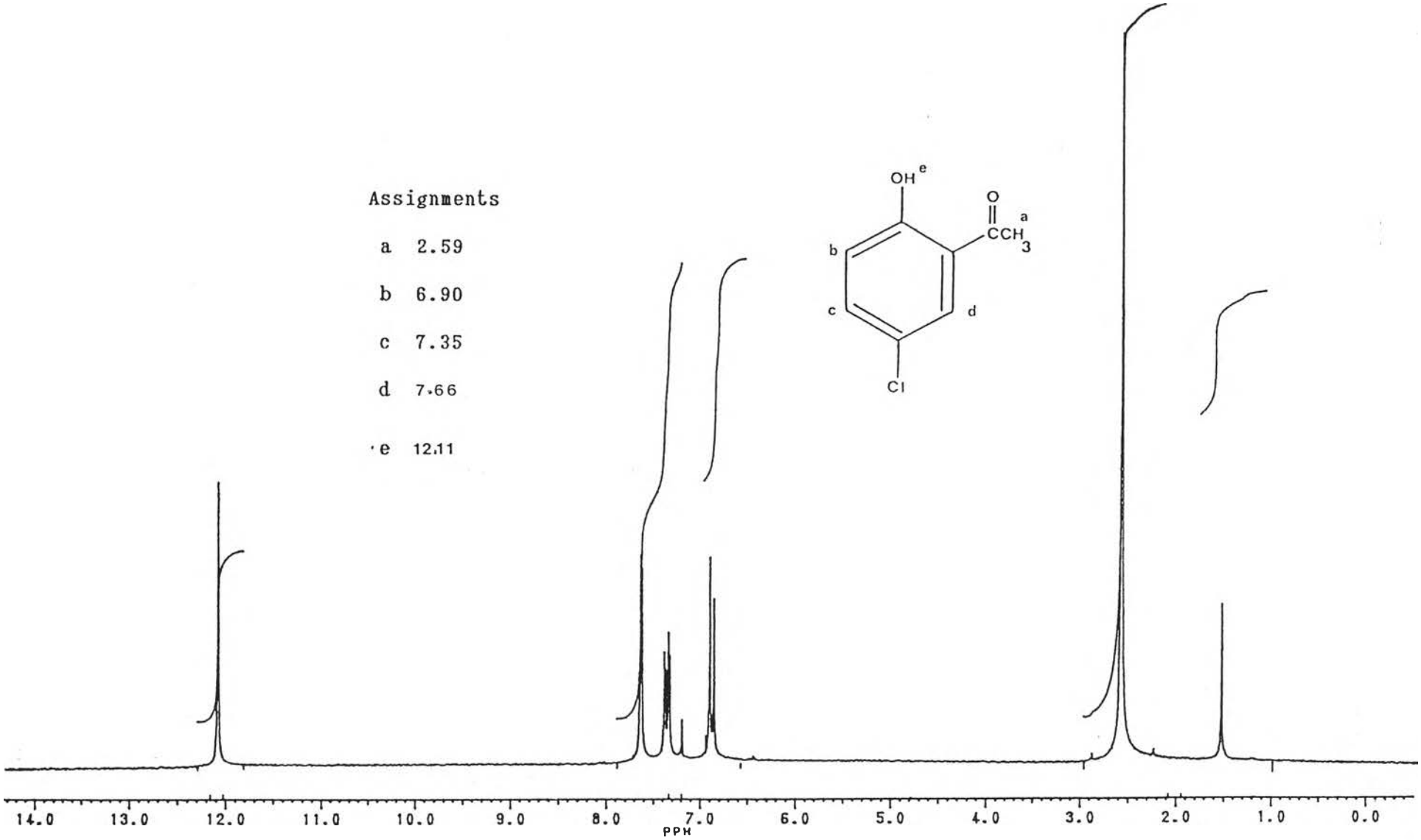


Figure 14 The ^{1}H-NMR spectrum of 5-Chloro-2-hydroxyacetophenone in $CDCl_3$.....

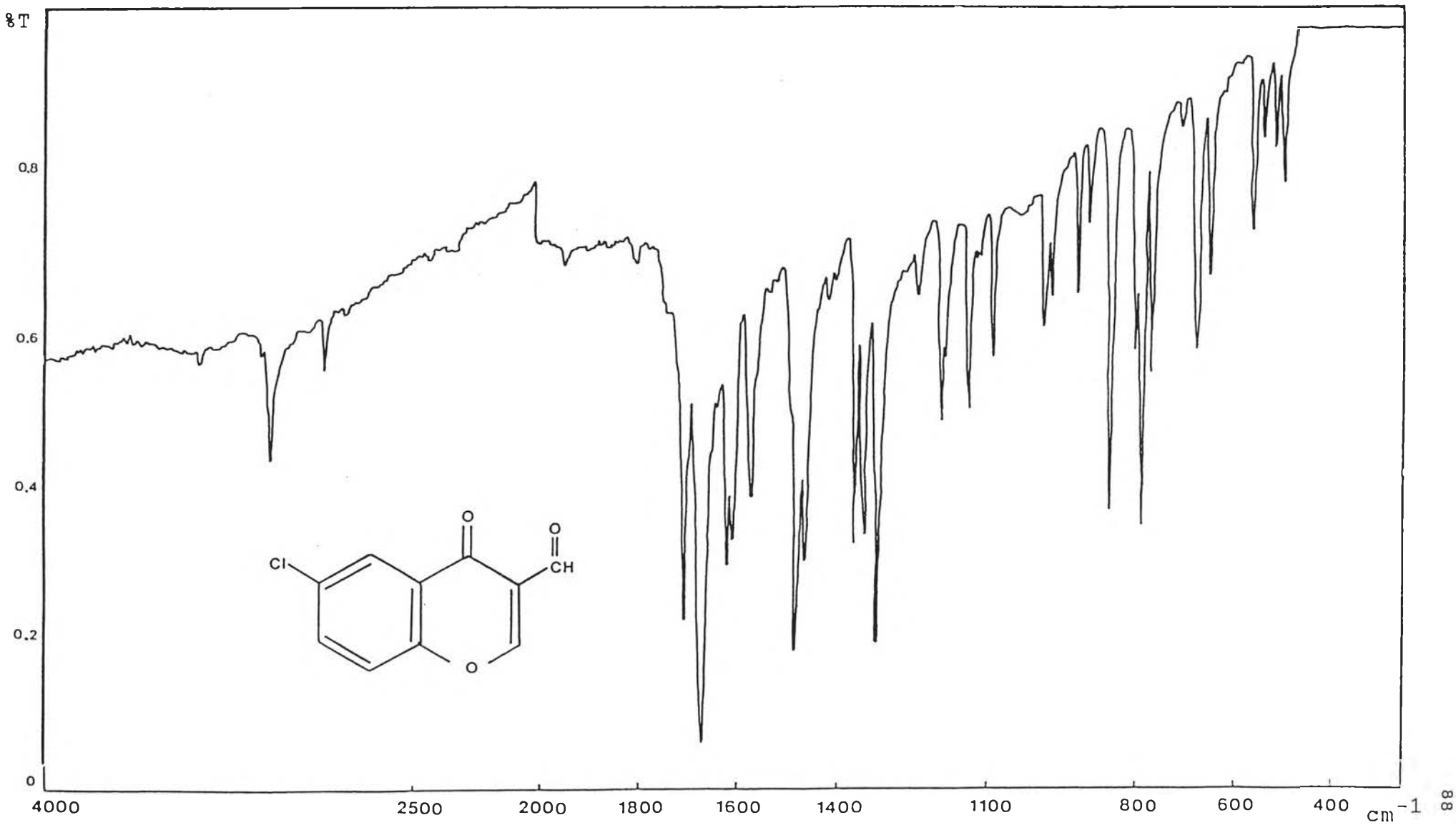


Figure 15 The IR spectrum of 6-Chlorochromone-3-carboxaldehyde

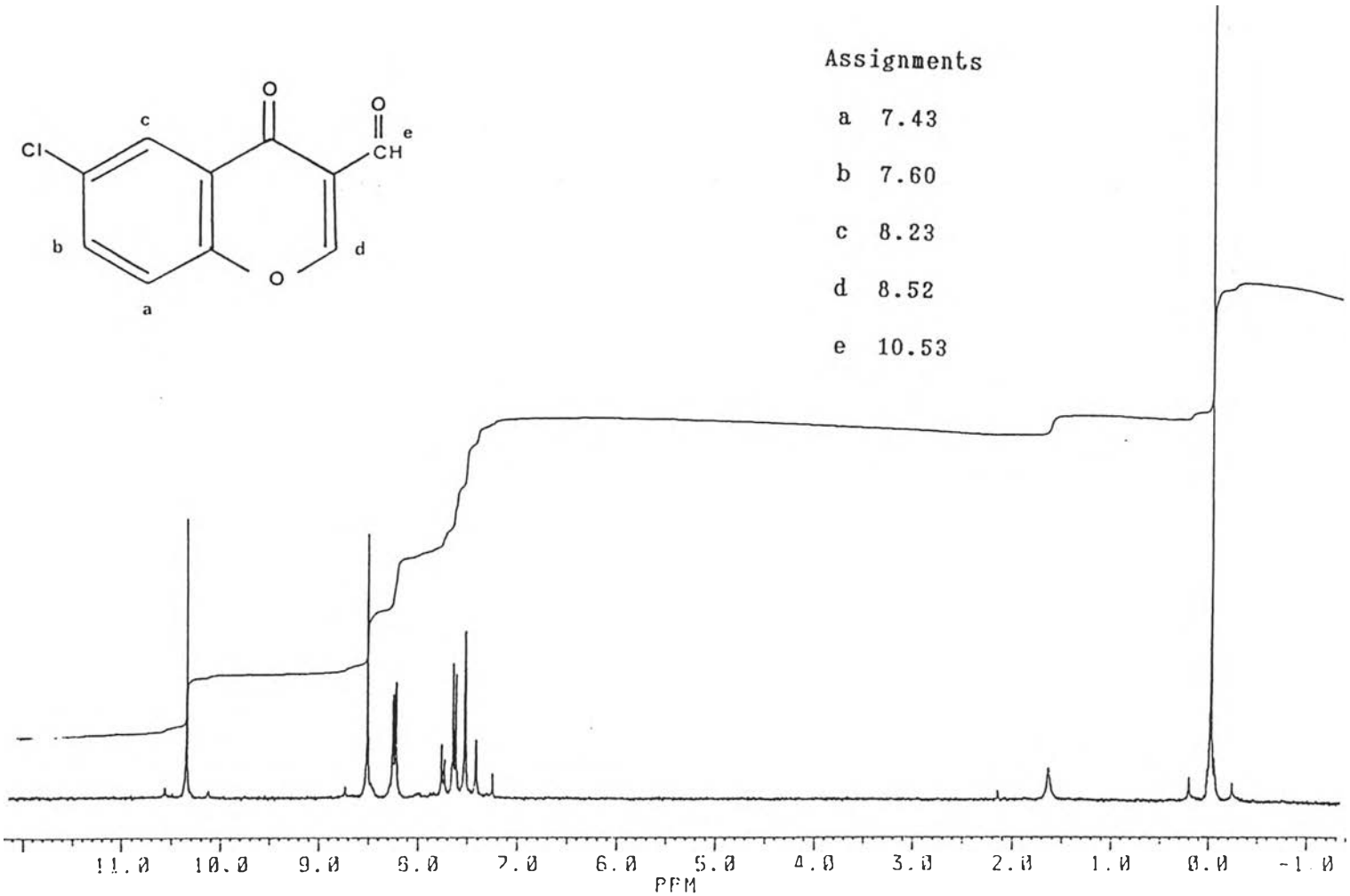


Figure 16 The ^{1}H-NMR spectrum of 6-Chlorochromone-3-carboxaldehyde in $CDCl_3$

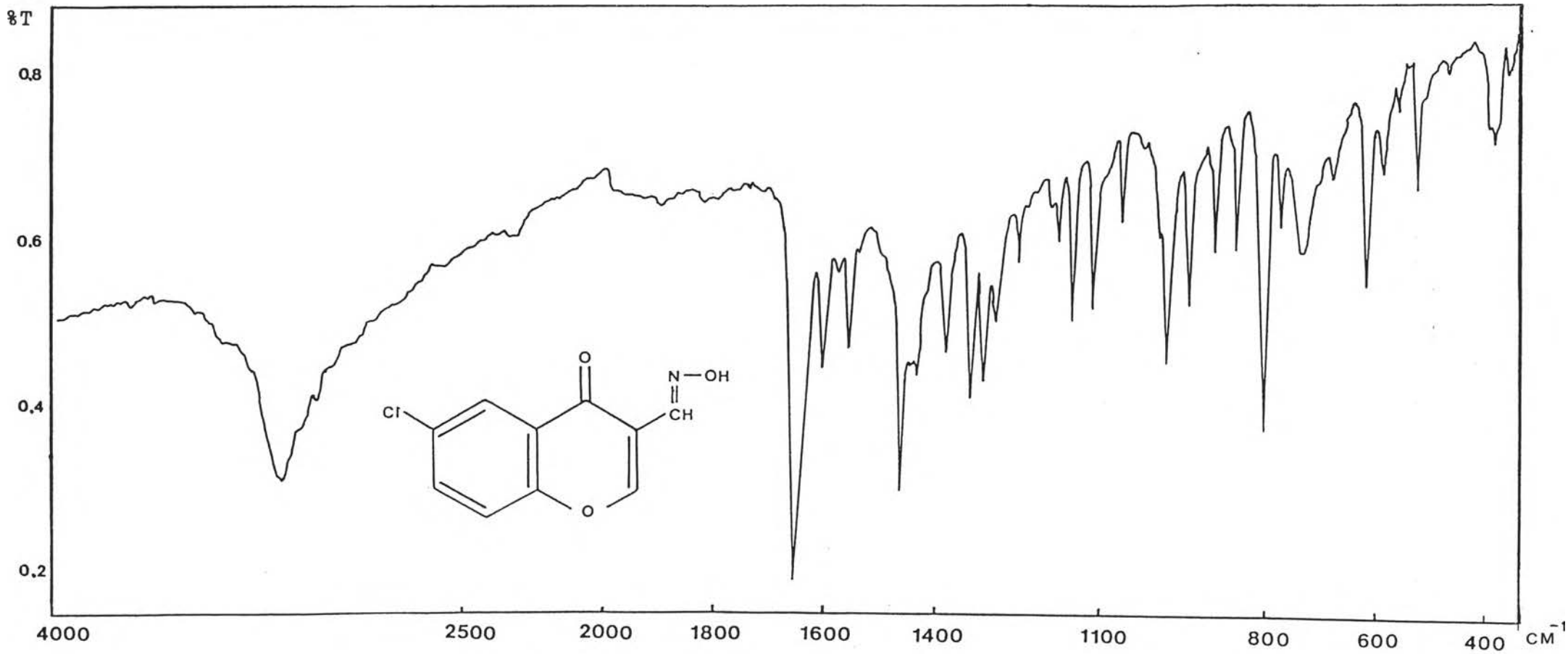


Figure 17 The IR spectrum of 6-Chlorochromone-3-carboaldoxime.

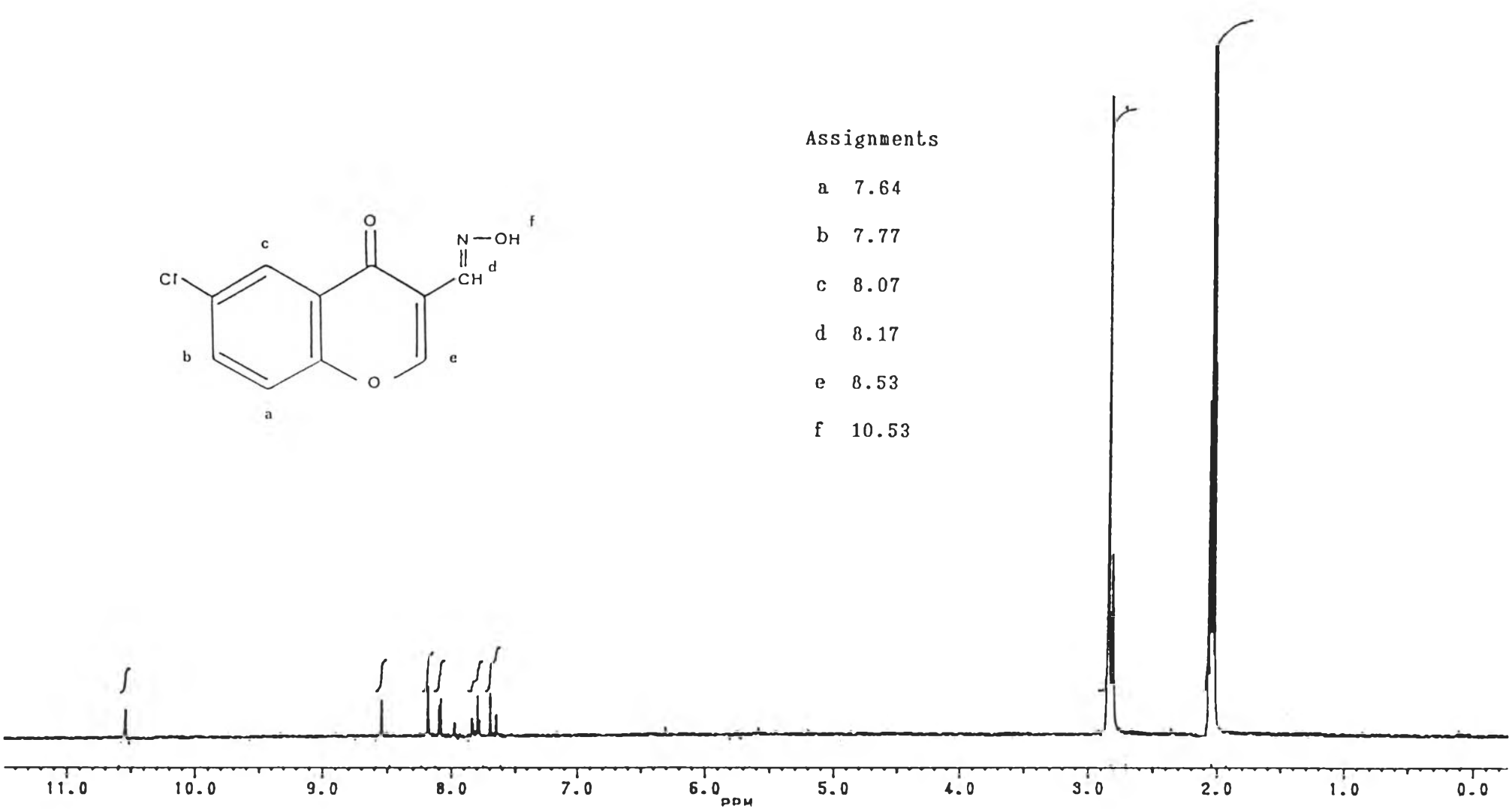
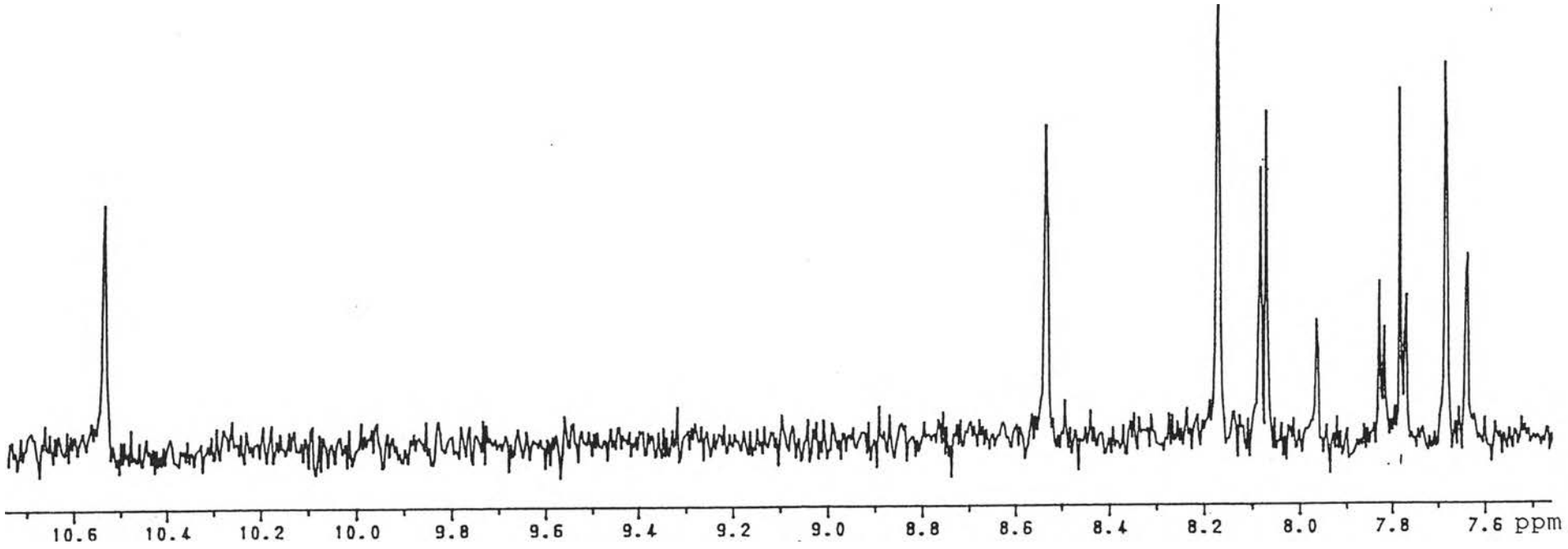


Figure 18 The ^{1}H-NMR spectrum of 6-Chlorochromone-3-carboaldoxime in acetone-d_6



FIGURES 18 The ^{1}H-NMR spectrum of 6-Chlorochromone-3-carboaldoxime in acetone-d_6. (expansion)

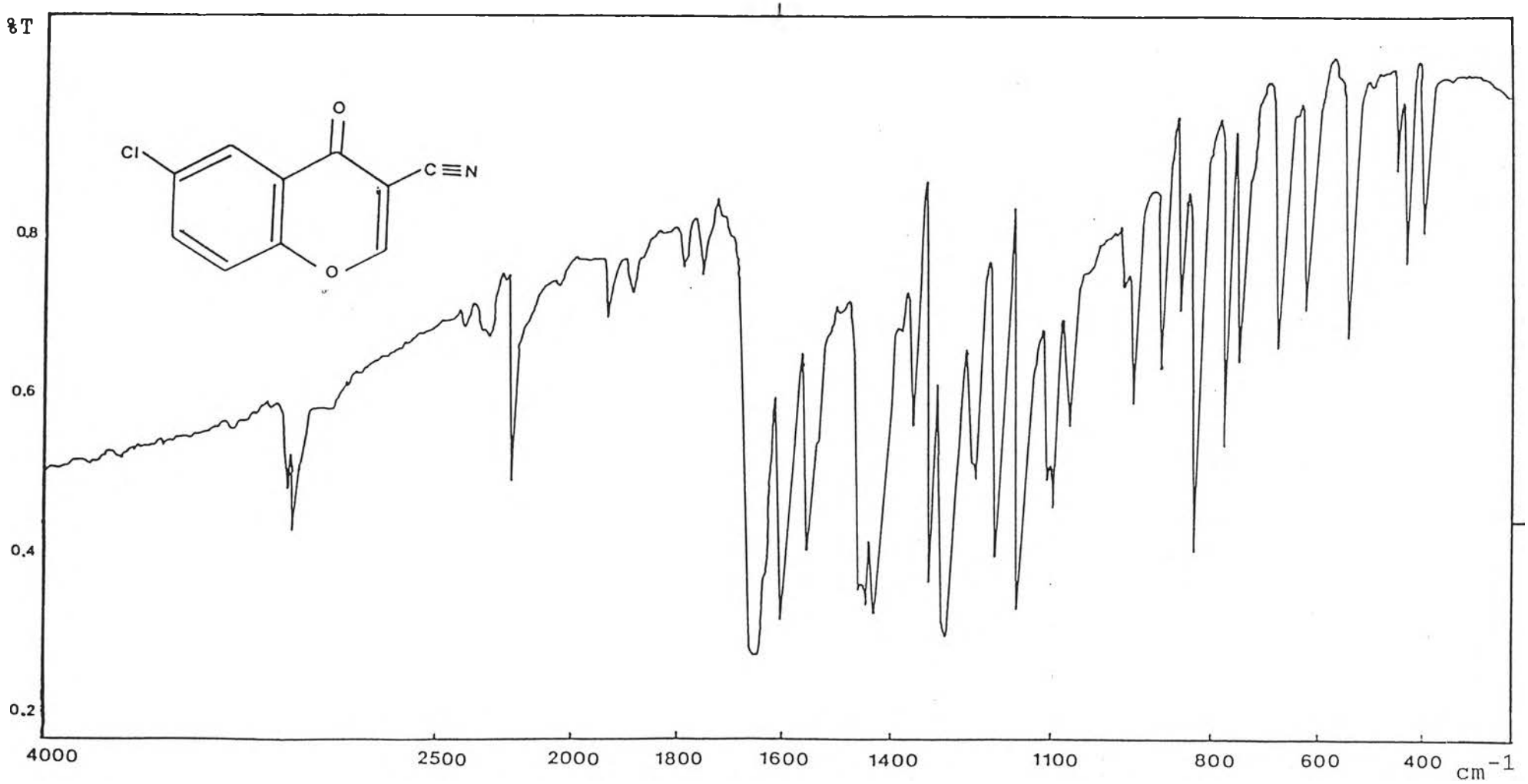


Figure 19 The IR spectrum of 6-Chlorochromone-3-carbonitrile.

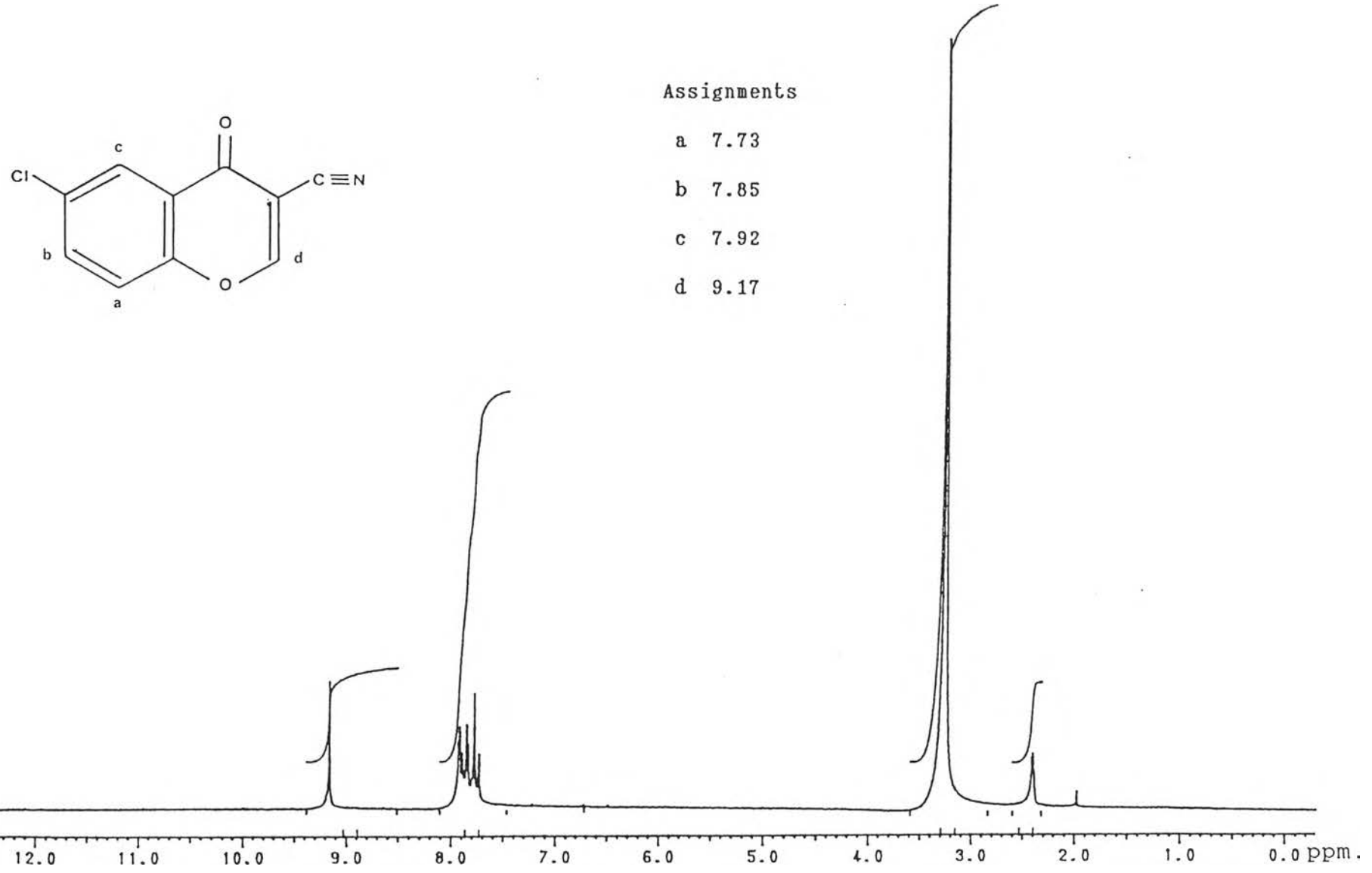


Figure 20 The ^{1}H-NMR spectrum of 6-Chlorochromone-3-carbonitrile in DMSO-d_6.

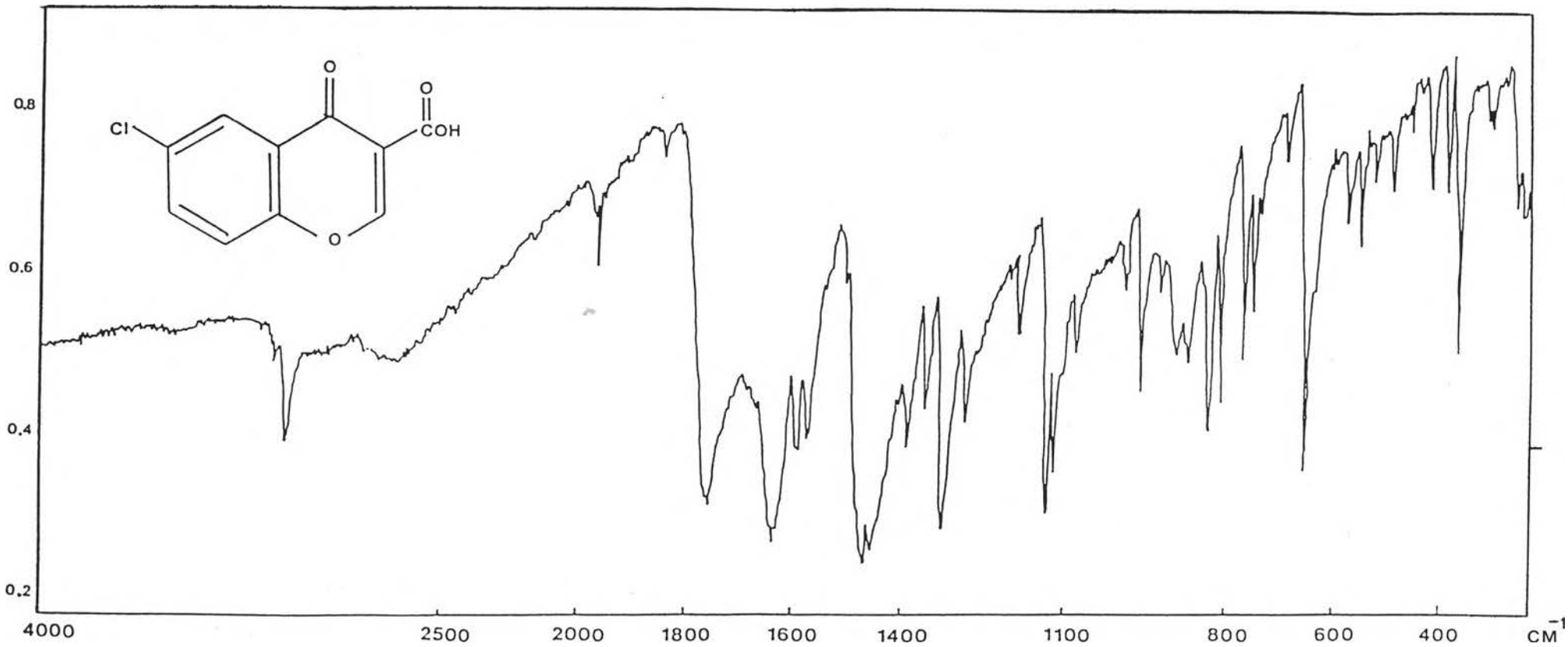


Figure 21 The IR spectrum of 6-Chlorochromone-3-carboxylic acid.

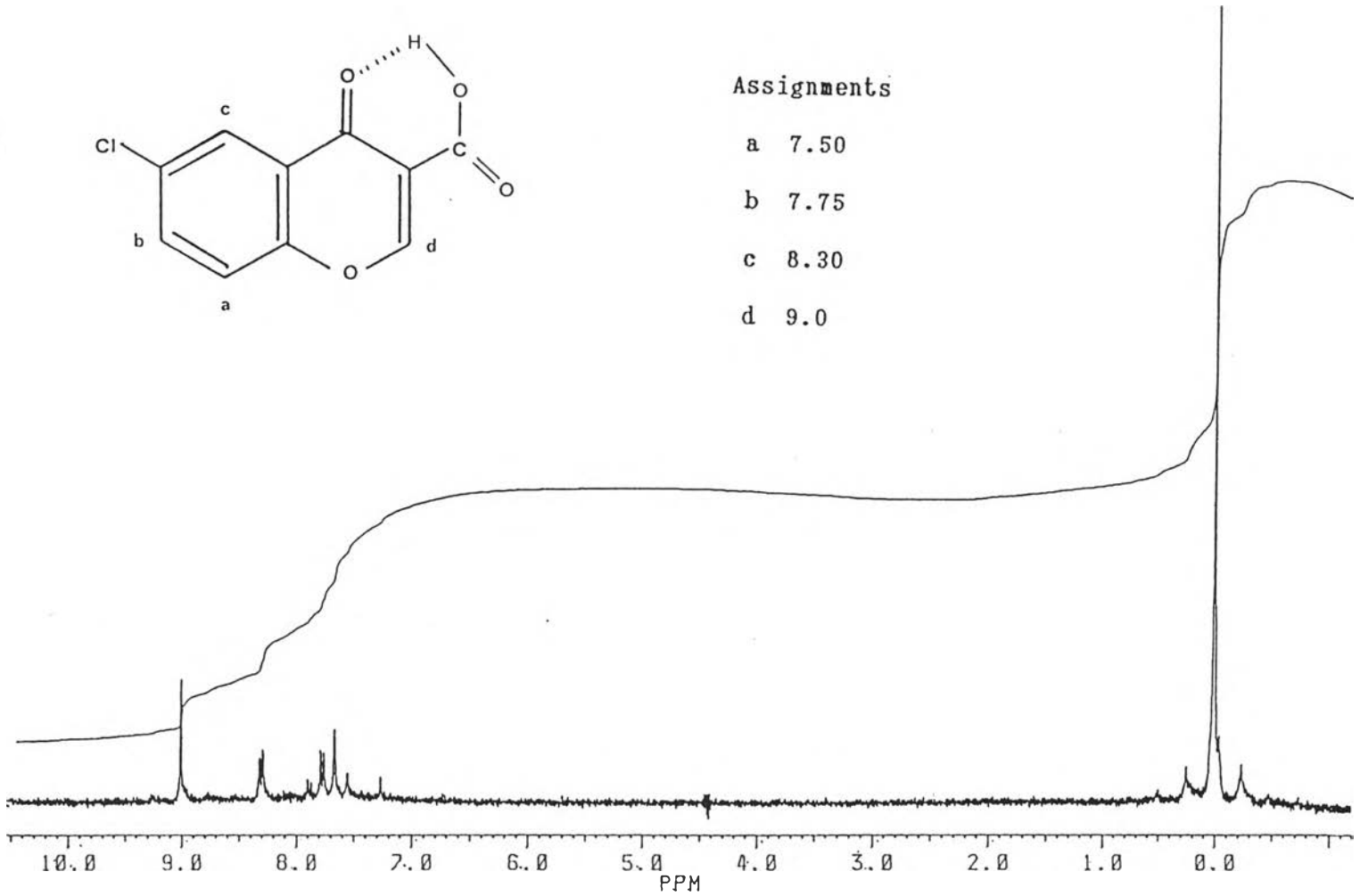


Figure 22 The ^{1}H-NMR spectrum of 6-Chlorochromone-3-carboxylic acid in $CDCl_3$.

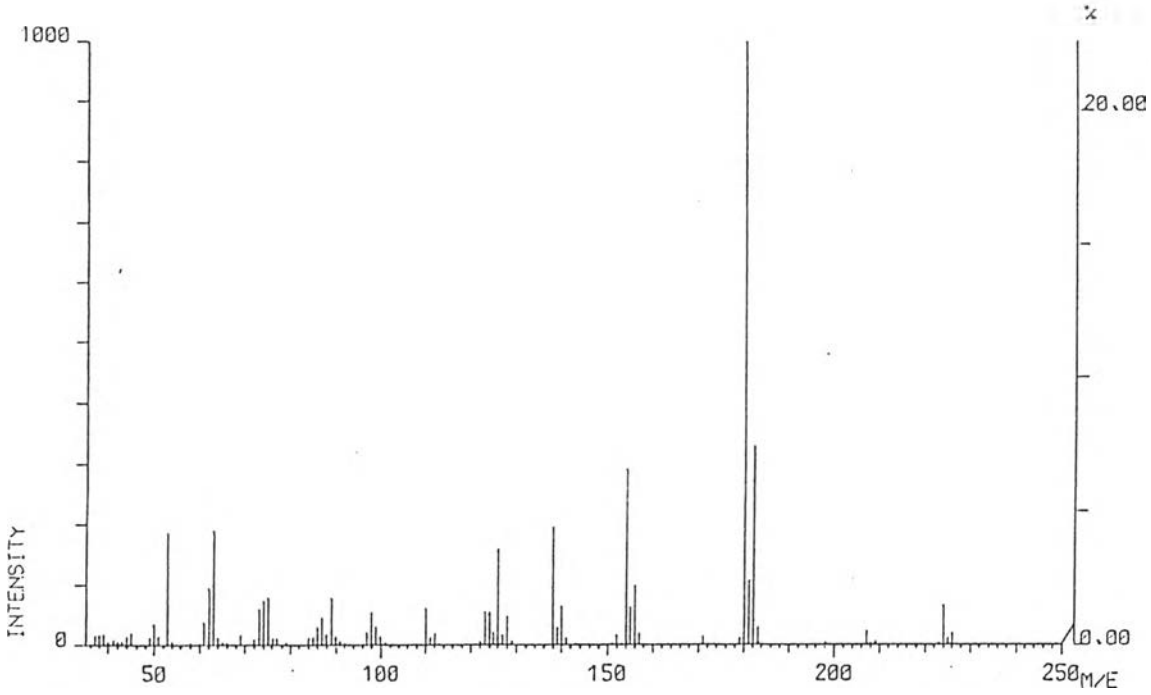


Figure 23 The mass spectrum of 6-Chlorochromone-3-carboxylic acid.

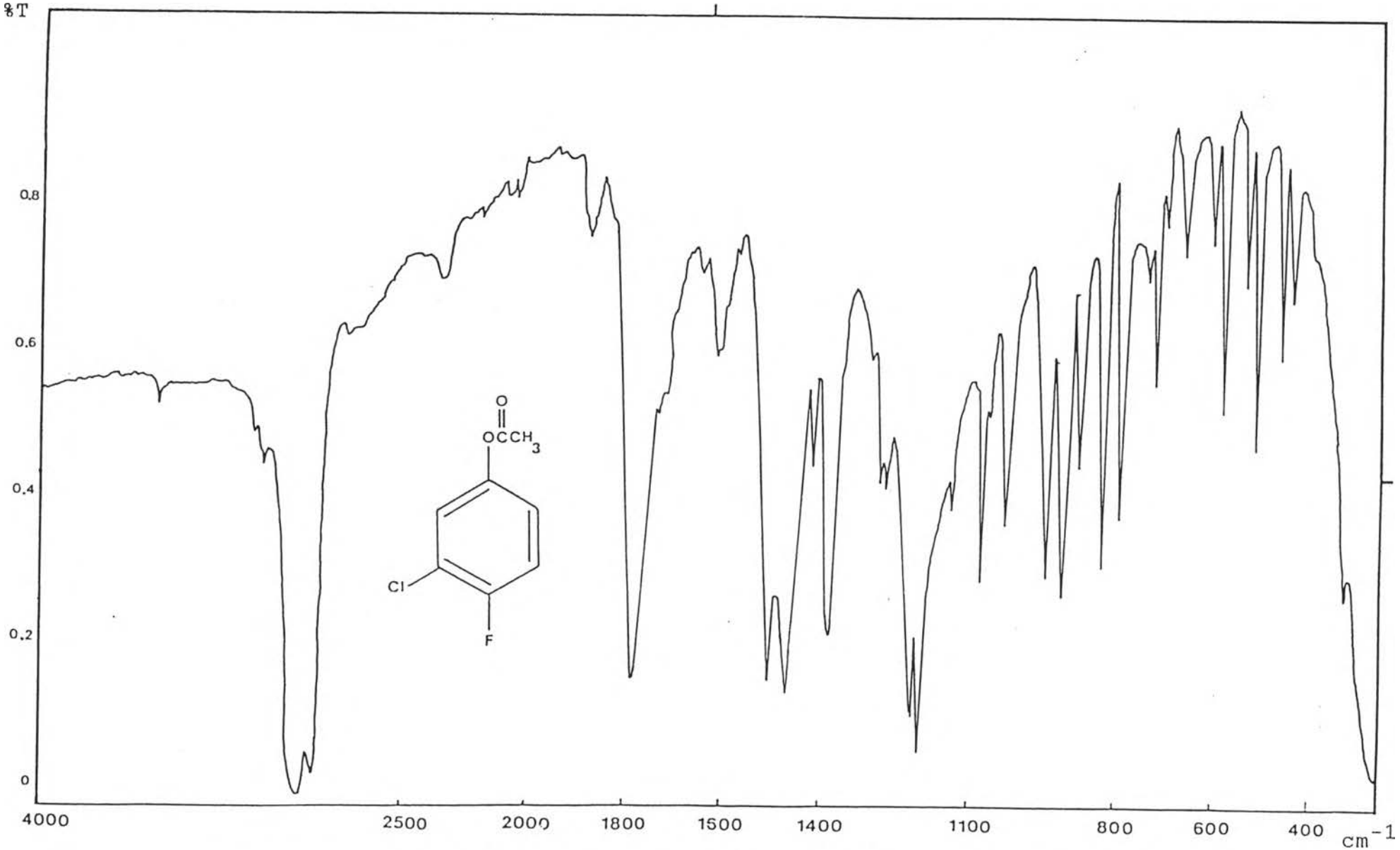


Figure 24 The IR spectrum of 3-Chloro-4-fluoro-phenyl acetate.

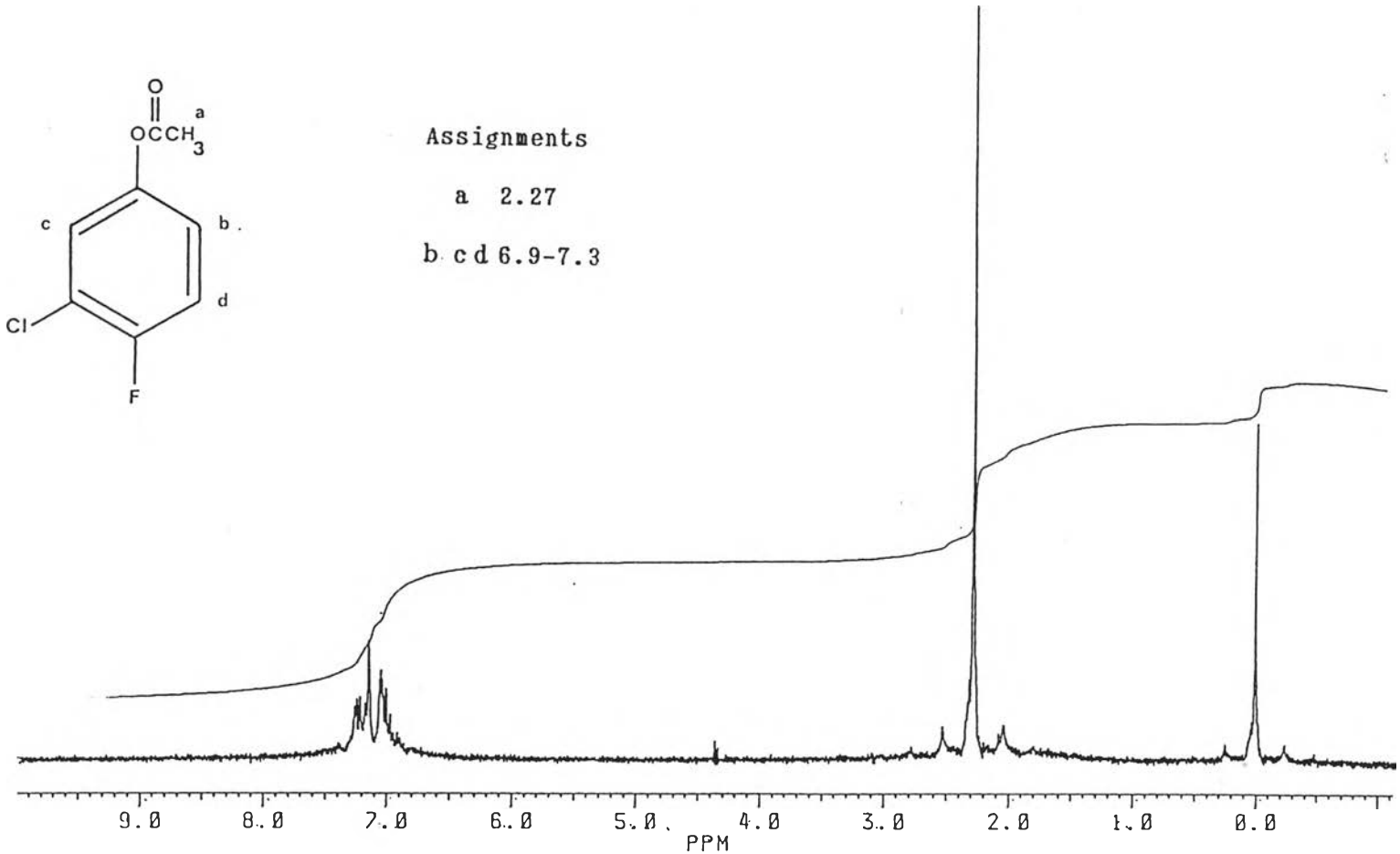


Figure 25 The ^{1}H-NMR spcetrum of 3-chloro-4-fluorophenyl acetate in $CDCl_3$.

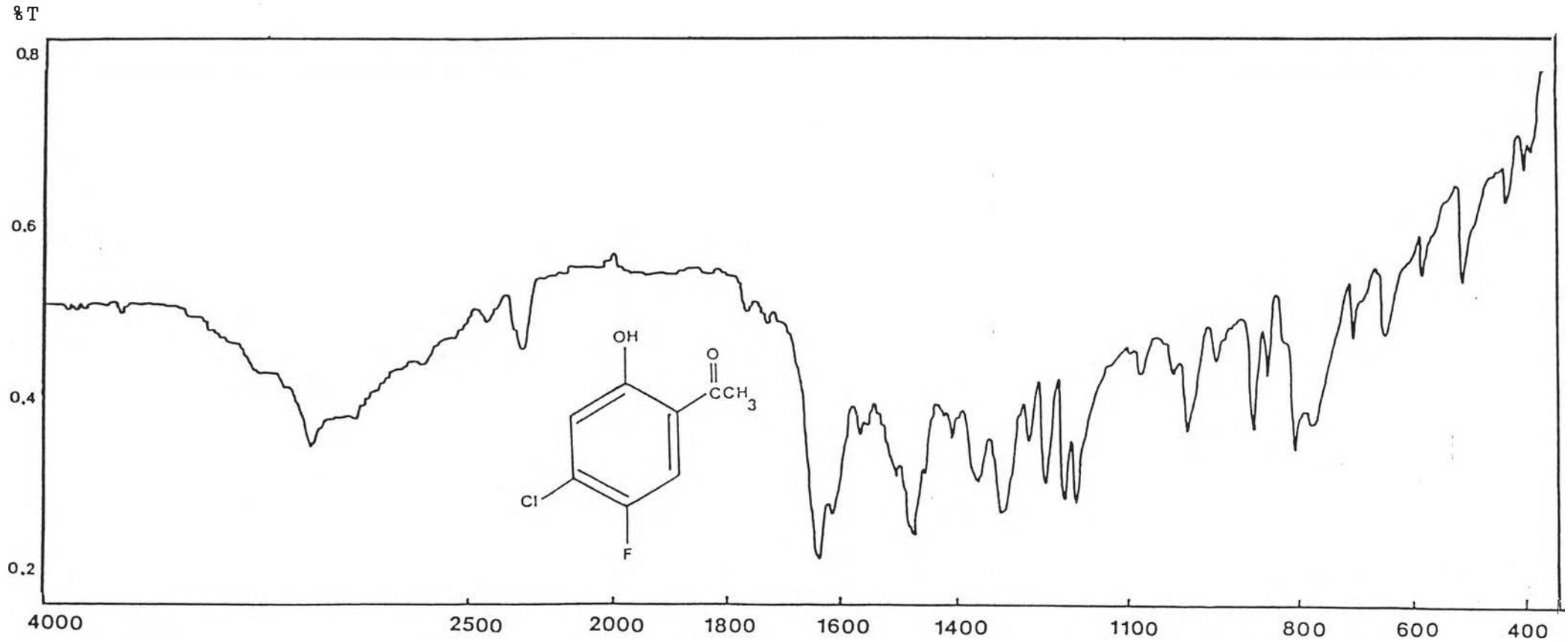


Figure 26 The IR spectrum of 4-Chloro-5-fluoro-2-hydroxyacetophenone.

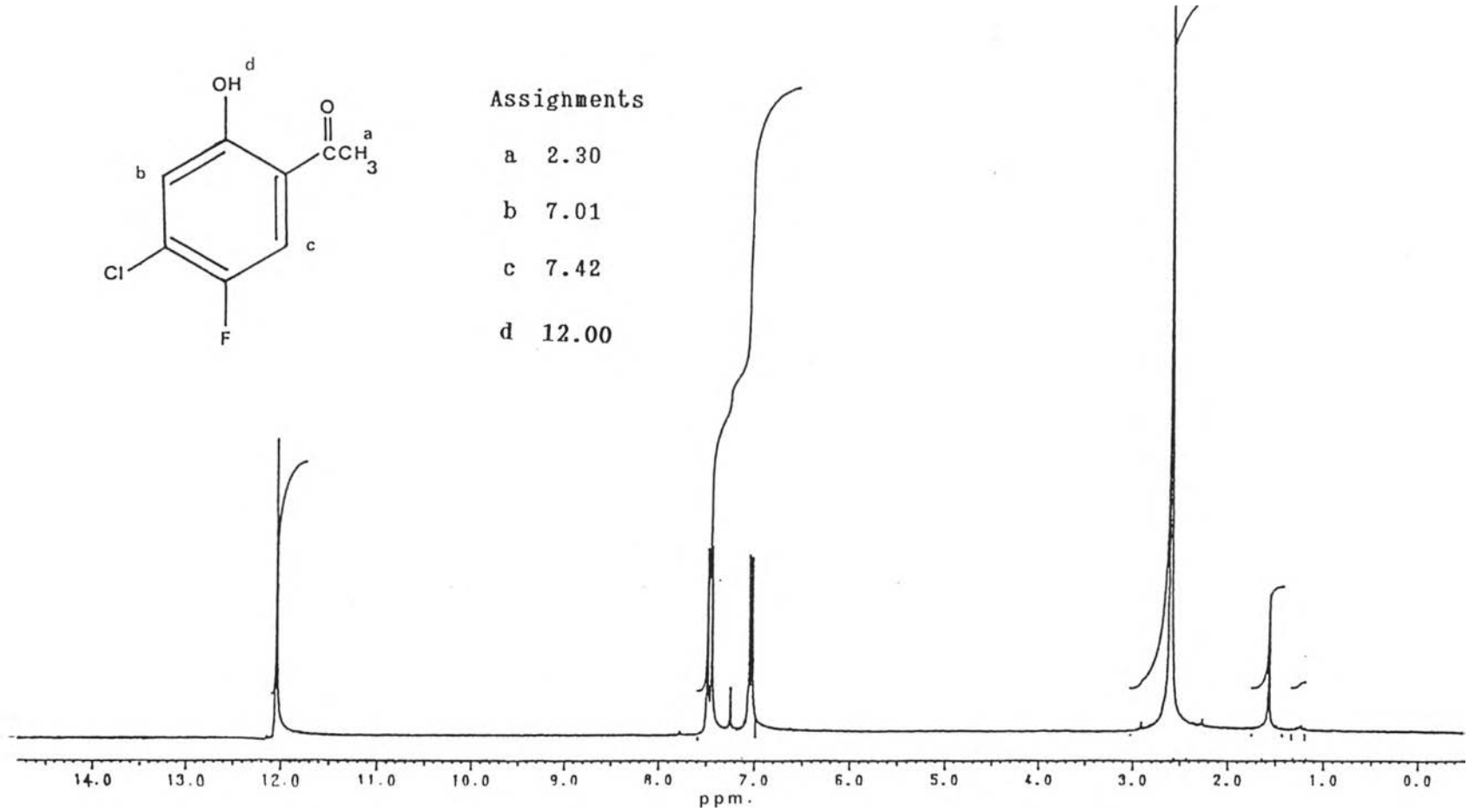


Figure 27 The ^{1}H-NMR spectrum of 4-Chloro-5-fluoro-2-hydroxyacetophenone in $CDCl_3$.

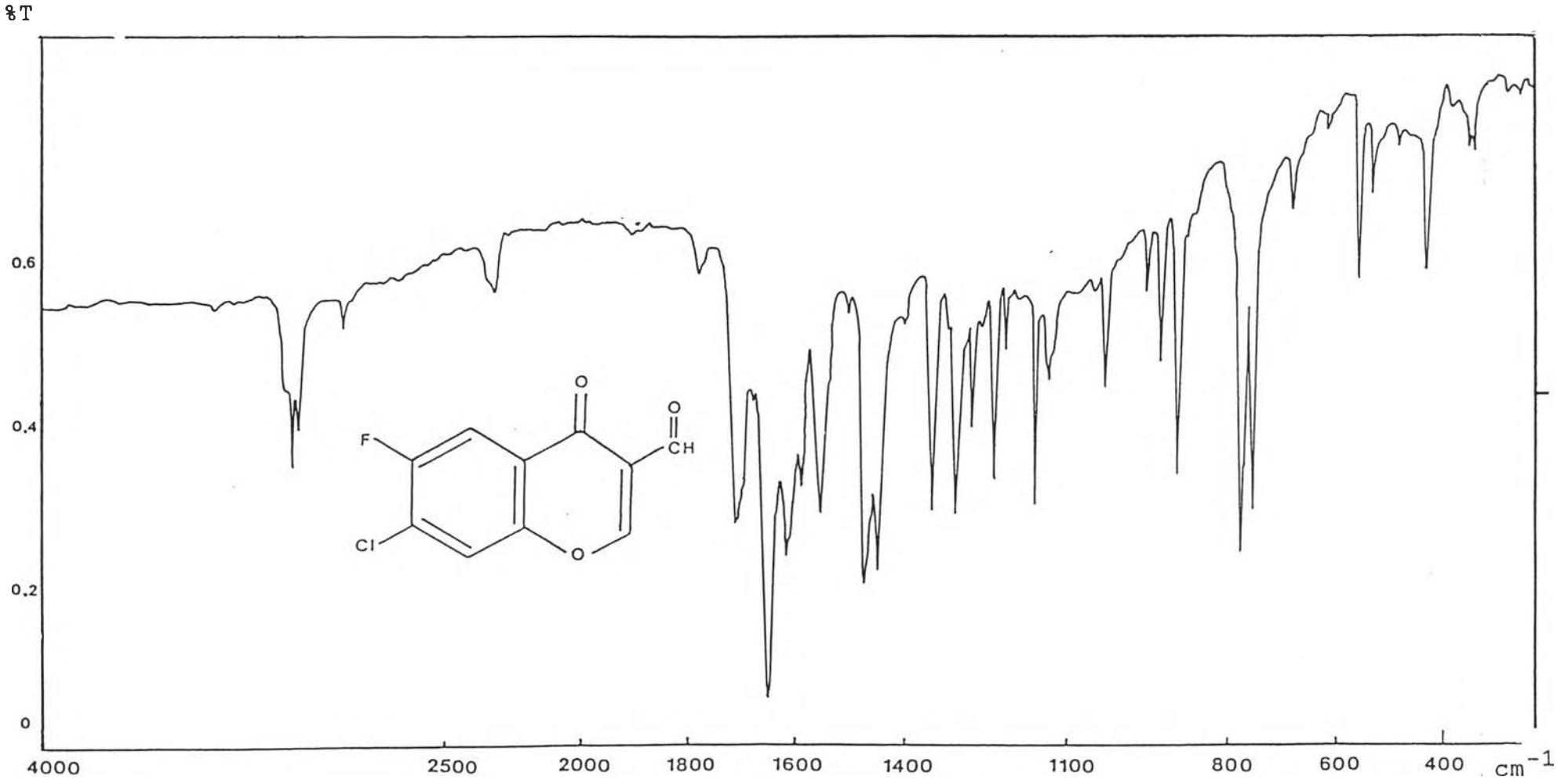


Figure 28 The IR spectrum of 7-Chloro-6-fluoro chromone-3-carboxaldehyde.

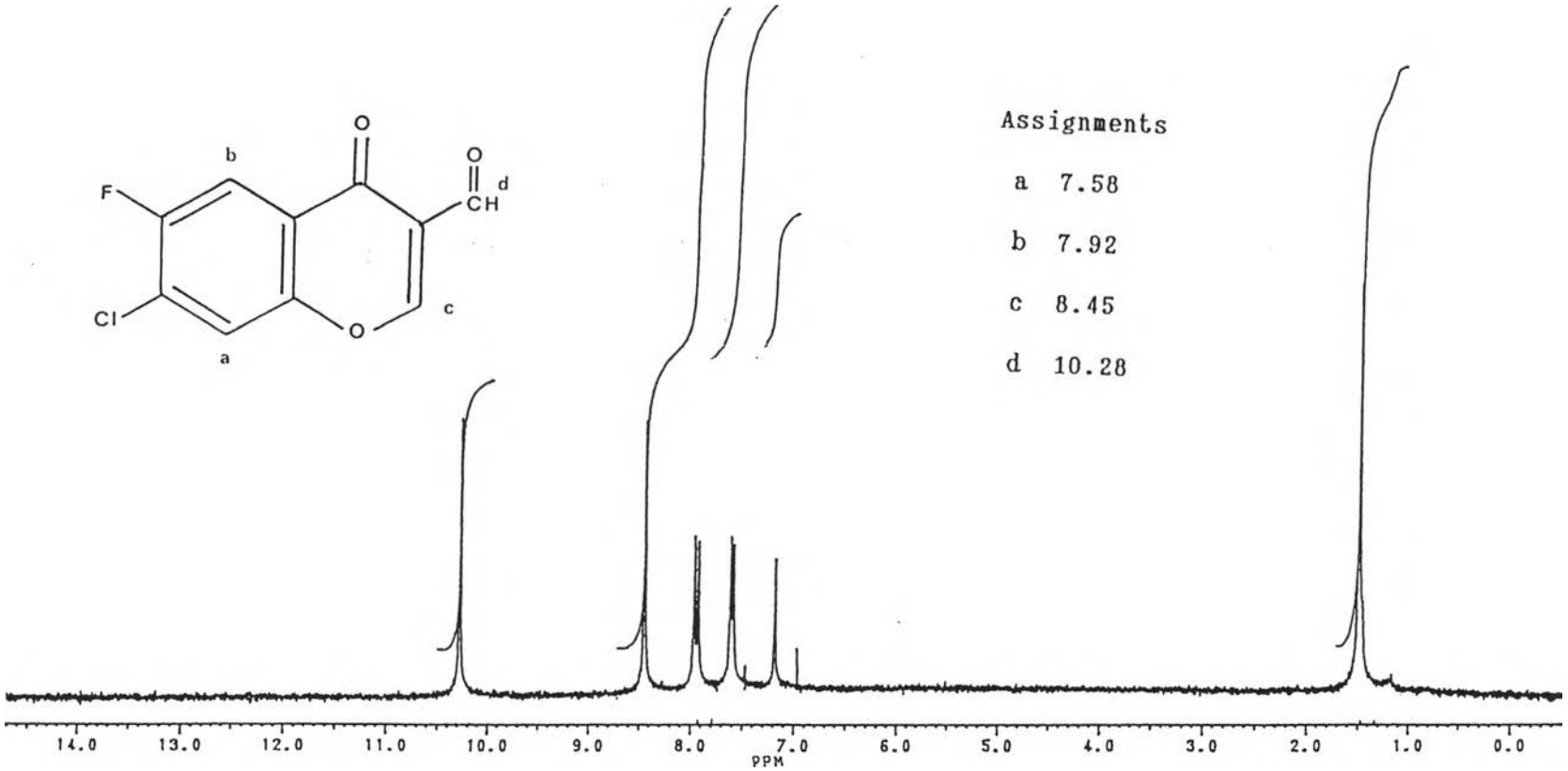


Figure 29 The ^{1}H-NMR spectrum of 7-Chloro-7-fluoro chromone-3-carboxaldehyde in $CDCl_3$

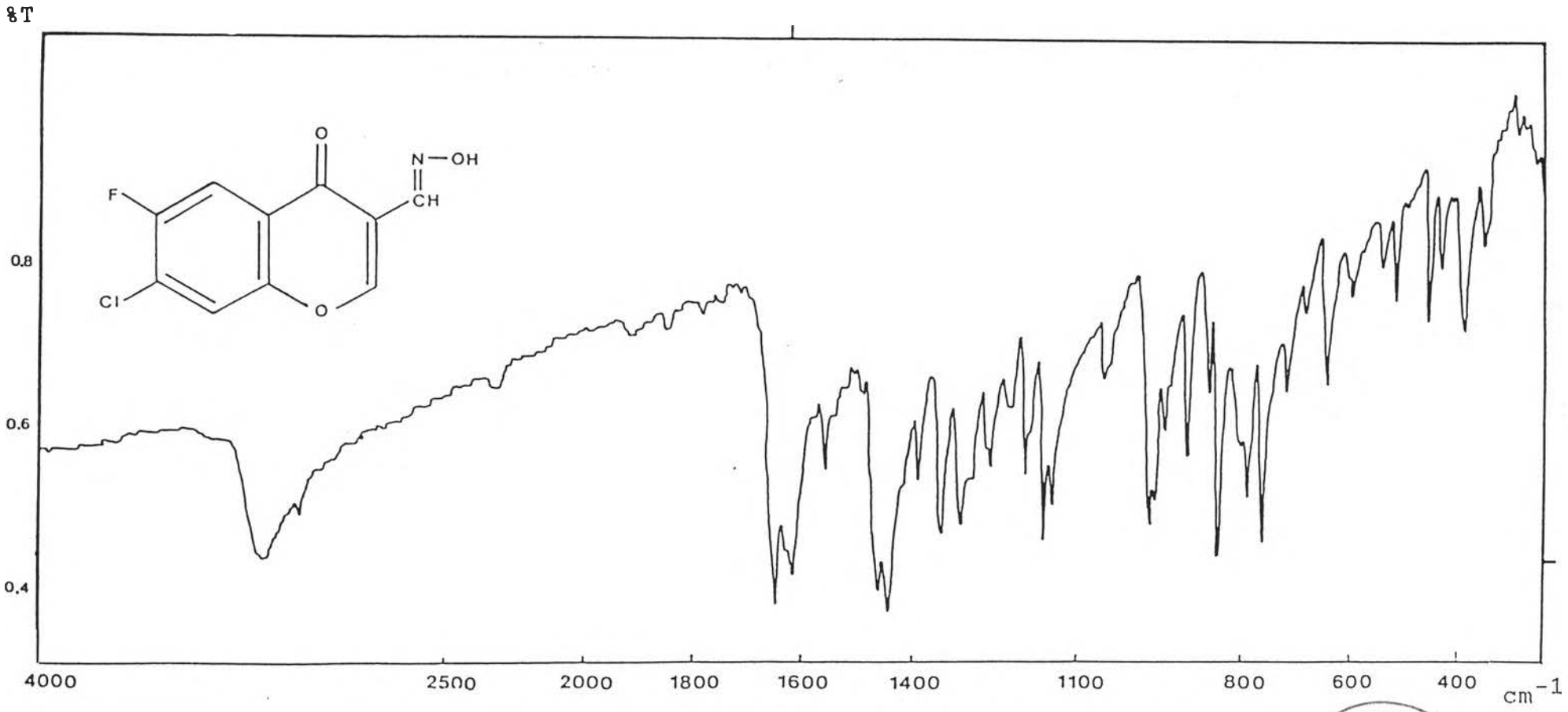


Figure 30 The IR spectrum of 7-Chloro-6-fluoro-chromone-3-carboaldoxime.

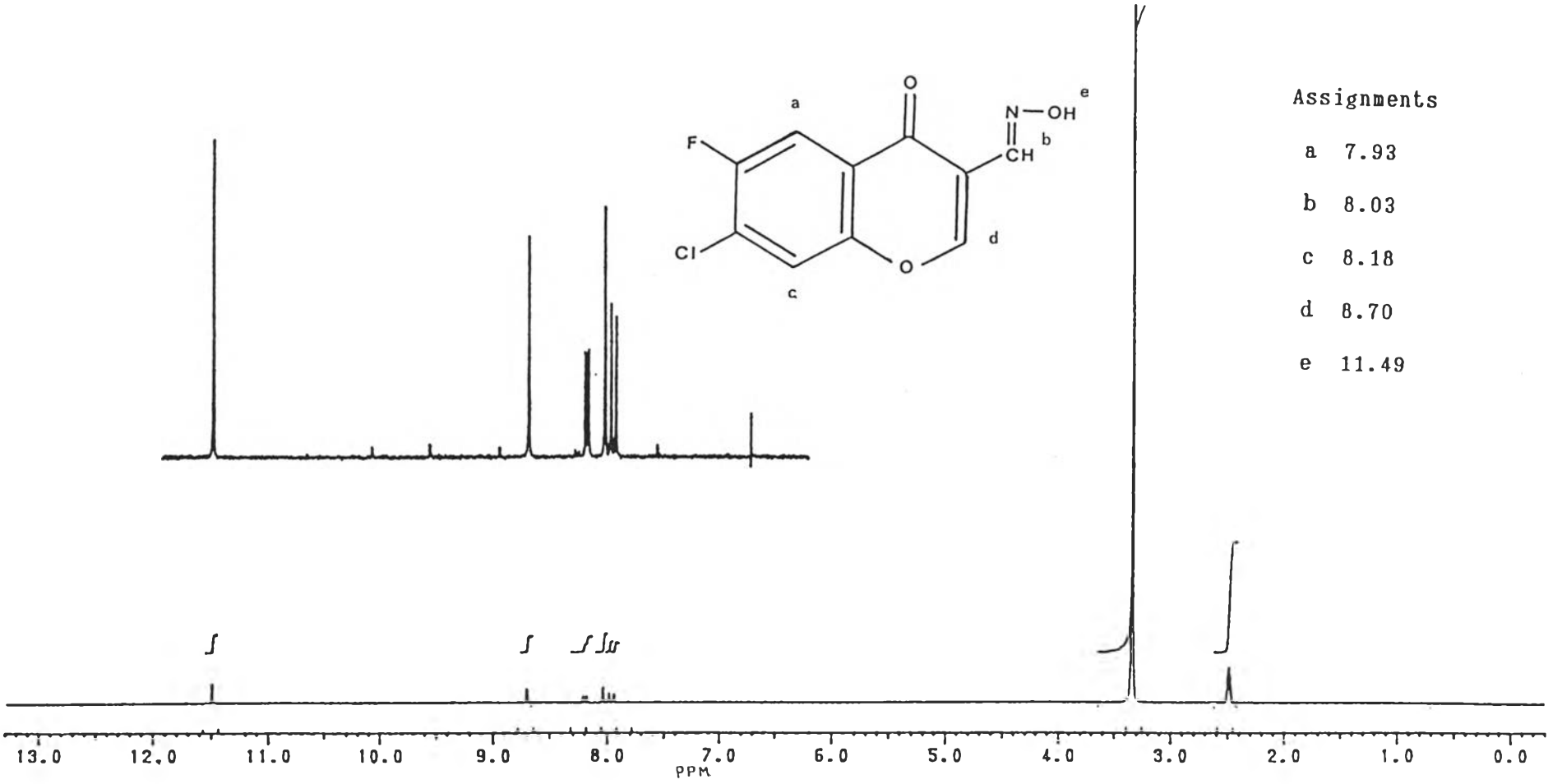


Figure 31 The ^{1}H-NMR spectrum of 7-Chloro-6-fluoro chromone-3-carboaldoxime in DMSO-d_6

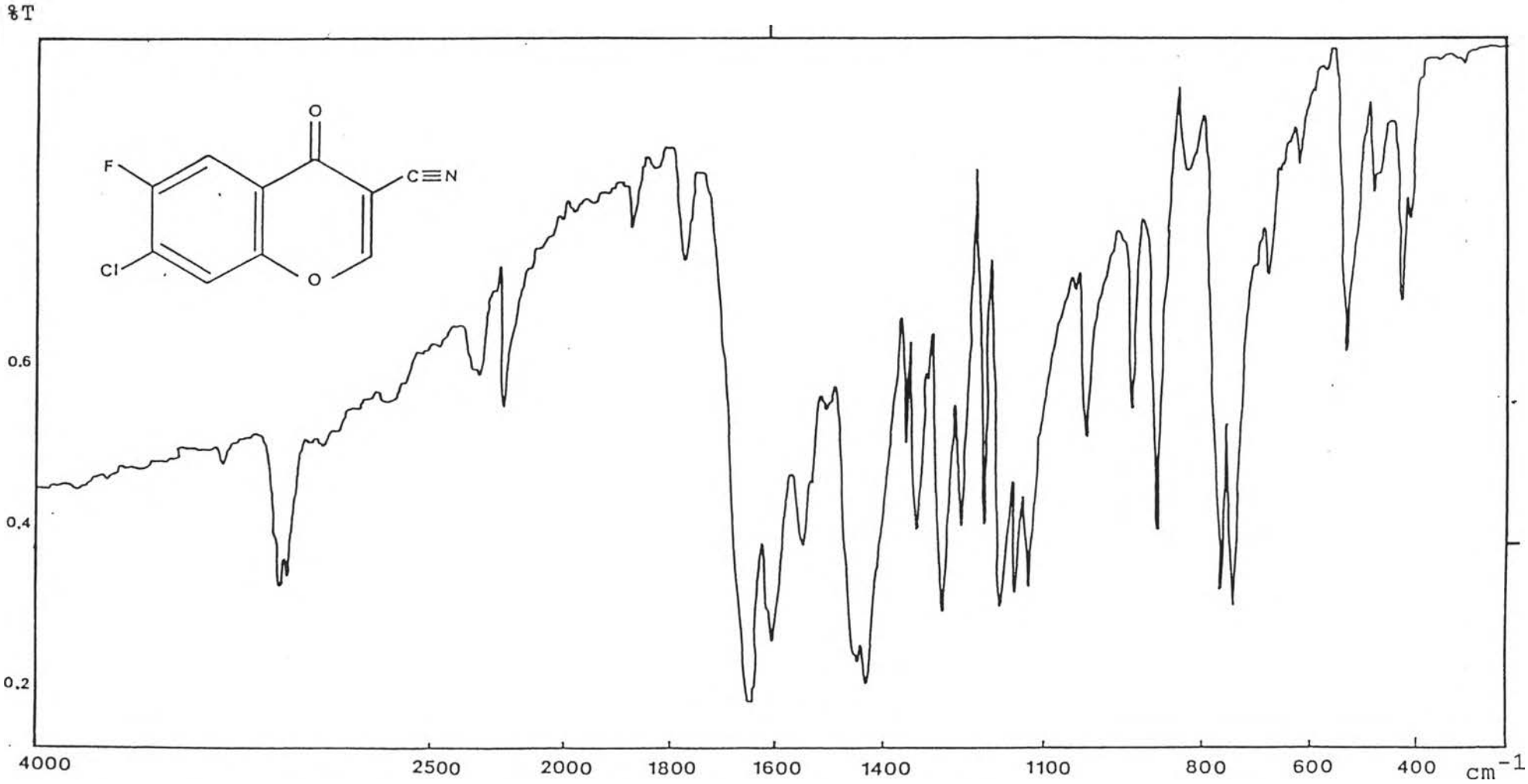


Figure 32 The IR spectrum of 7-Chloro-6-fluoro chromone-3-carbonitrile

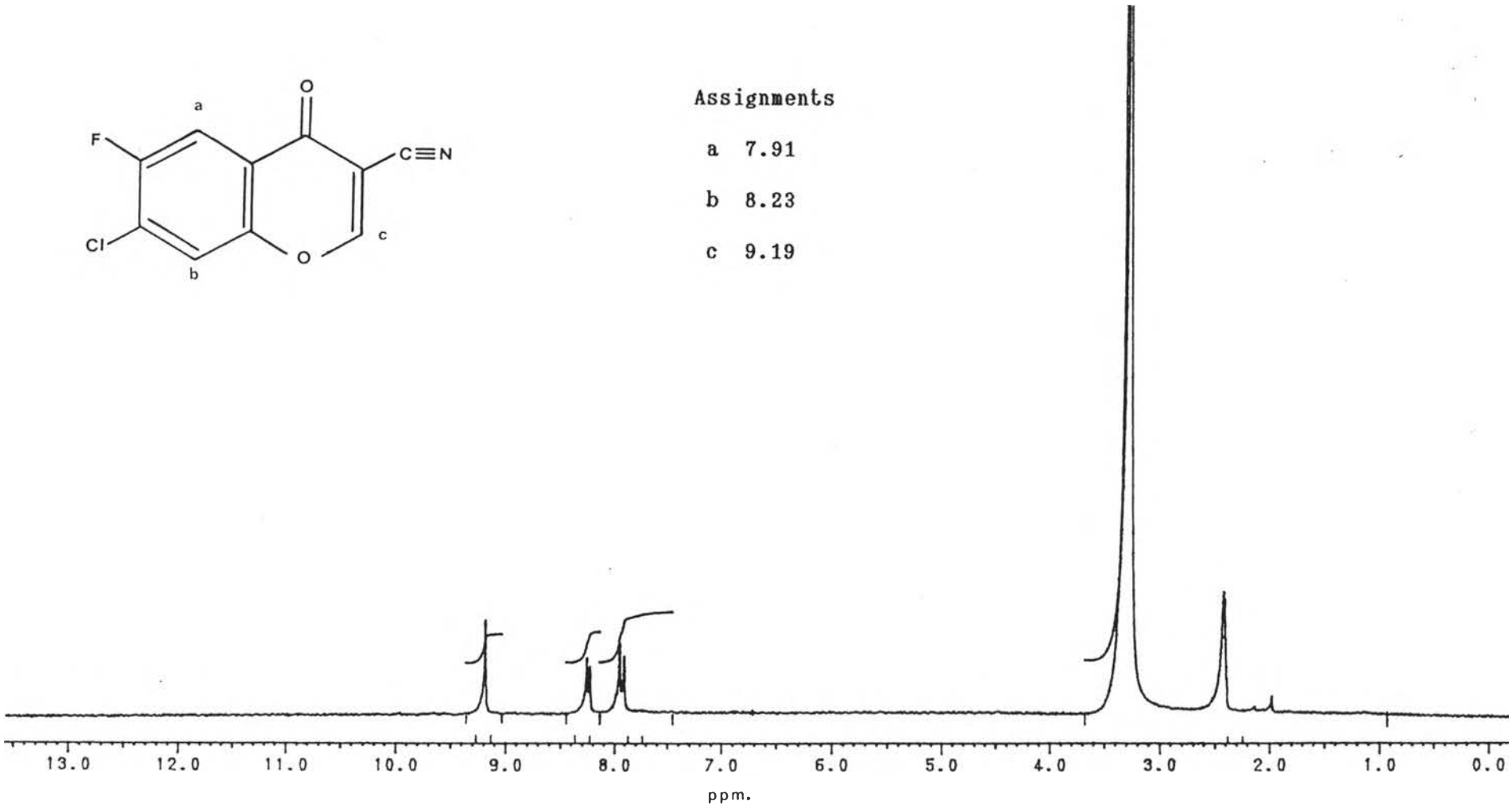


Figure 33 . The ^{1}H-NMR spectrum of 7-Chloro-6-fluoro chromone-3-carbonitrile in DMSO-d_6

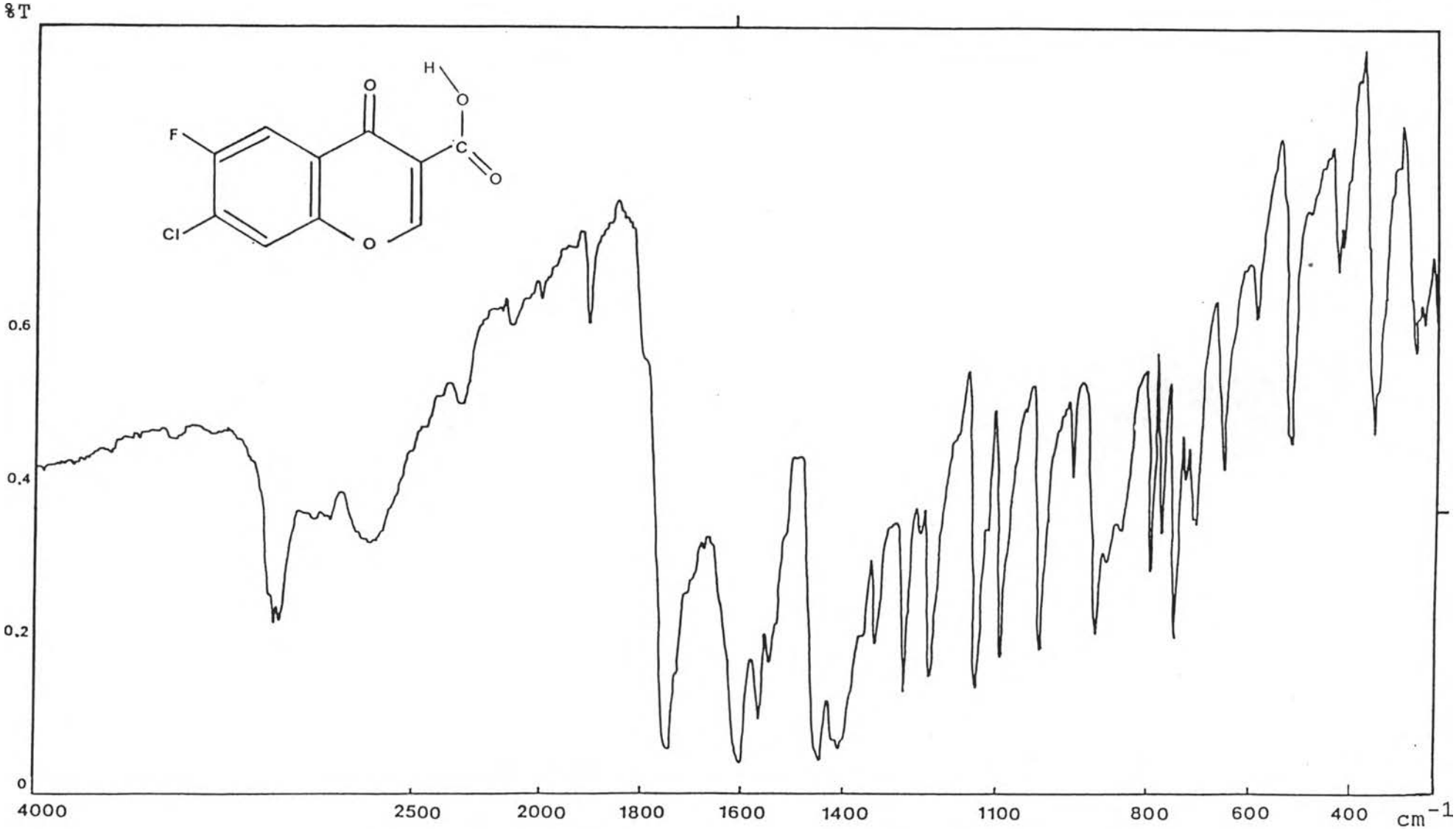


Figure 34 The IR spectrum of 7-Chloro-6-fluoro-chromone-3-carboxylic acid.

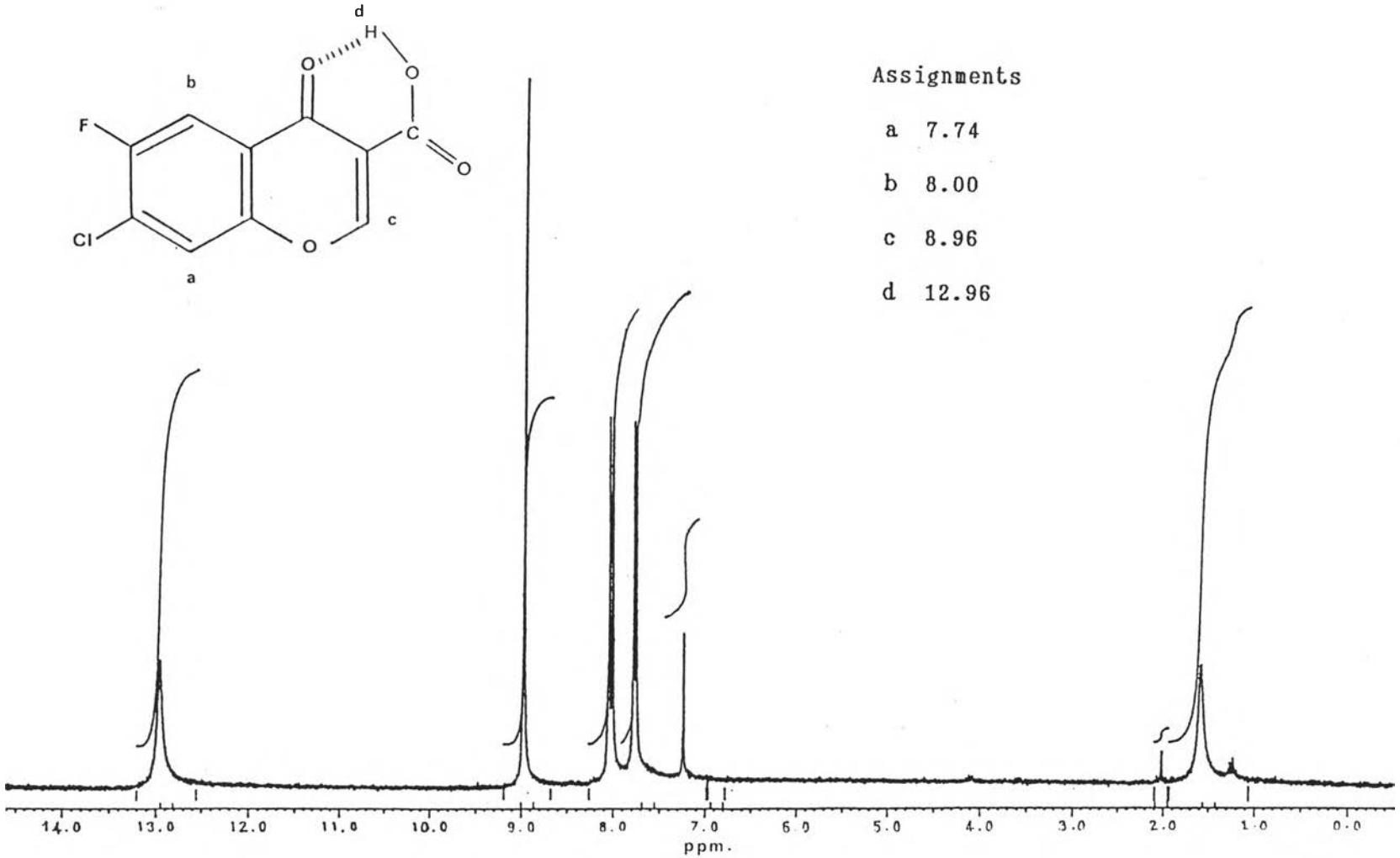


Figure 35 The ^{1}H-NMR spectrum of 7-Chloro-6-fluoro chromone-3-carboxylic acid in $CDCl_3$

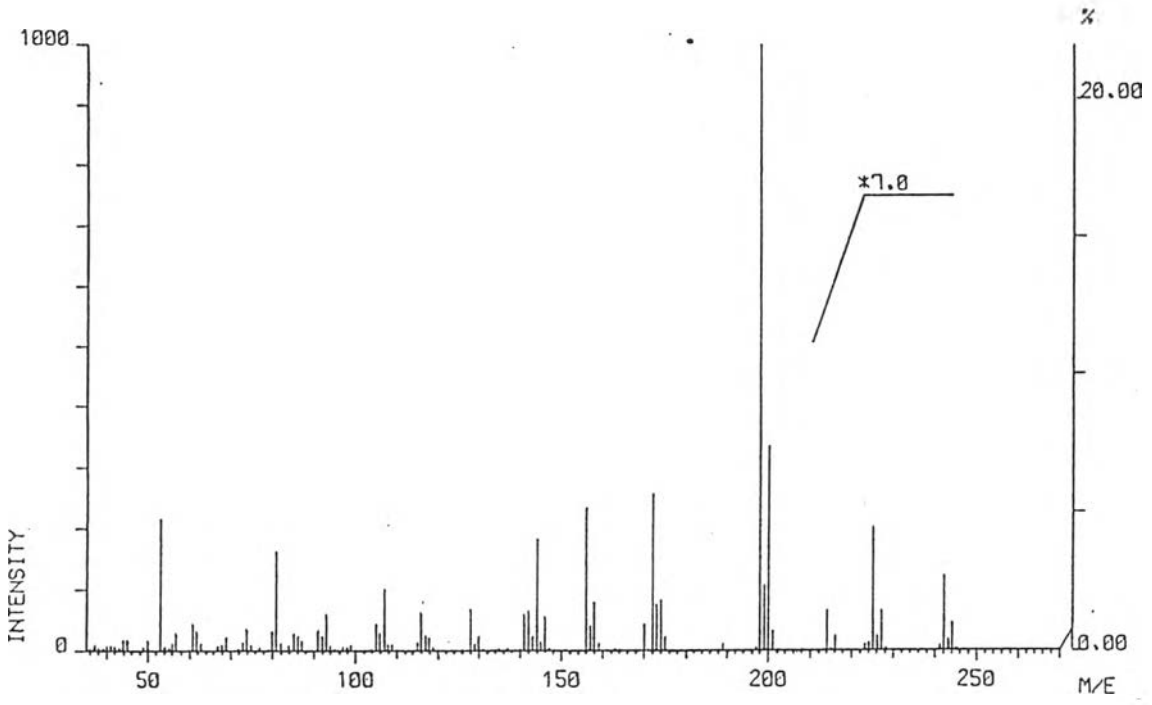


Figure 36 The mass spectrum of 7-Chloro-6-fluoro-chromone-3-carboxylic acid

VITA

Mr. Wiphoosit Limwong was born on November 1967, in Nakornsrithammarat, Southern of Thailand. He graduated with a Bachelor's degree of Pharmaceutical Science from faculty of Pharmaceutical Sceince, Prince of Songhkla University, Songhkla in 1989.