

ESAMI DI STATO PER L'ABILITAZIONE ALL'ESERCIZIO DELLA PROFESSIONE DI CHIMICO

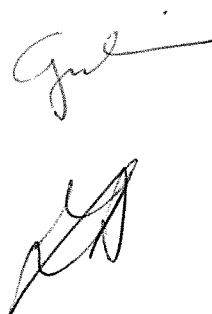
PRIMA SESSIONE DELL'ANNO 2013

Prima prova scritta

Tecniche spettroscopiche per l'analisi chimica

Proprietà e reattività dei composti carbonilici

Gli alogeni

Two handwritten signatures in black ink. The top signature is a cursive name, possibly 'Gual', followed by a horizontal line. The bottom signature is a more stylized, blocky cursive signature.

ESAMI DI STATO PER L'ABILITAZIONE ALL'ESERCIZIO DELLA PROFESSIONE DI CHIMICO

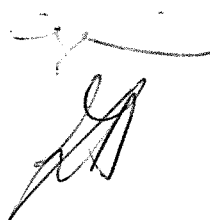
PRIMA SESSIONE DELL'ANNO 2013

Seconda prova scritta

Metodologie analitiche in chimica ambientale

Processi di sintesi industriale di prodotti inorganici

Sintesi e caratterizzazione di composti polimerici

A handwritten signature in black ink, consisting of a series of loops and strokes, located in the lower right quadrant of the page.

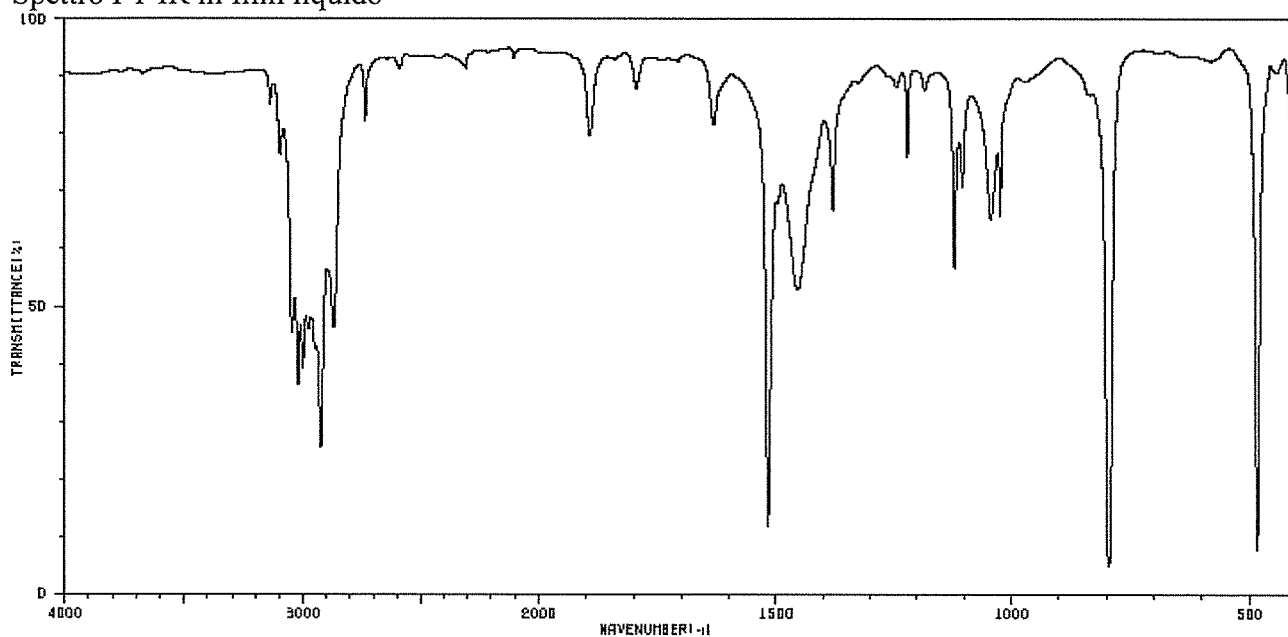
COMPOSTO 5: formula bruta C_8H_{10}

CS
20

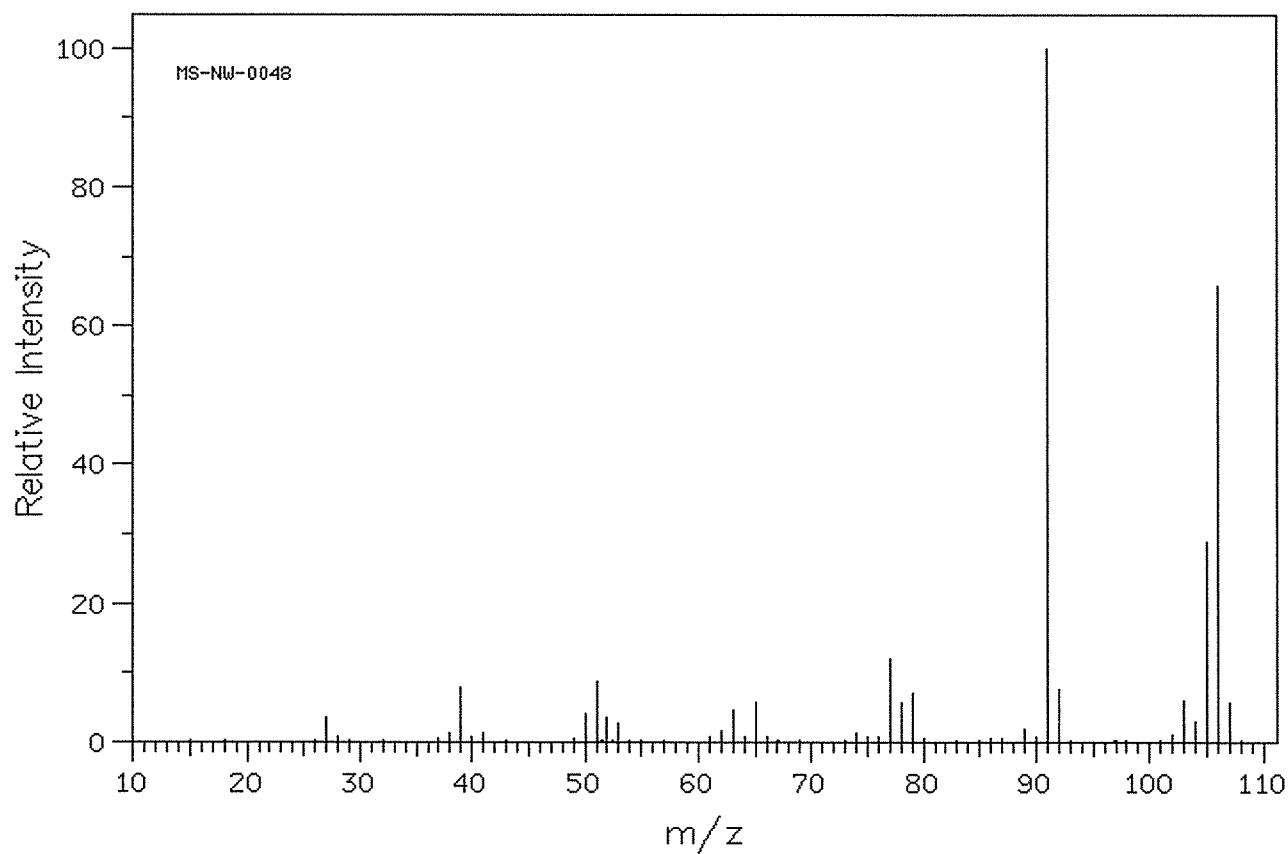
Identificare il composto dai dati presentati.
Distinguere i due isomeri A e B spiegando le attribuzioni

ISOMERO A

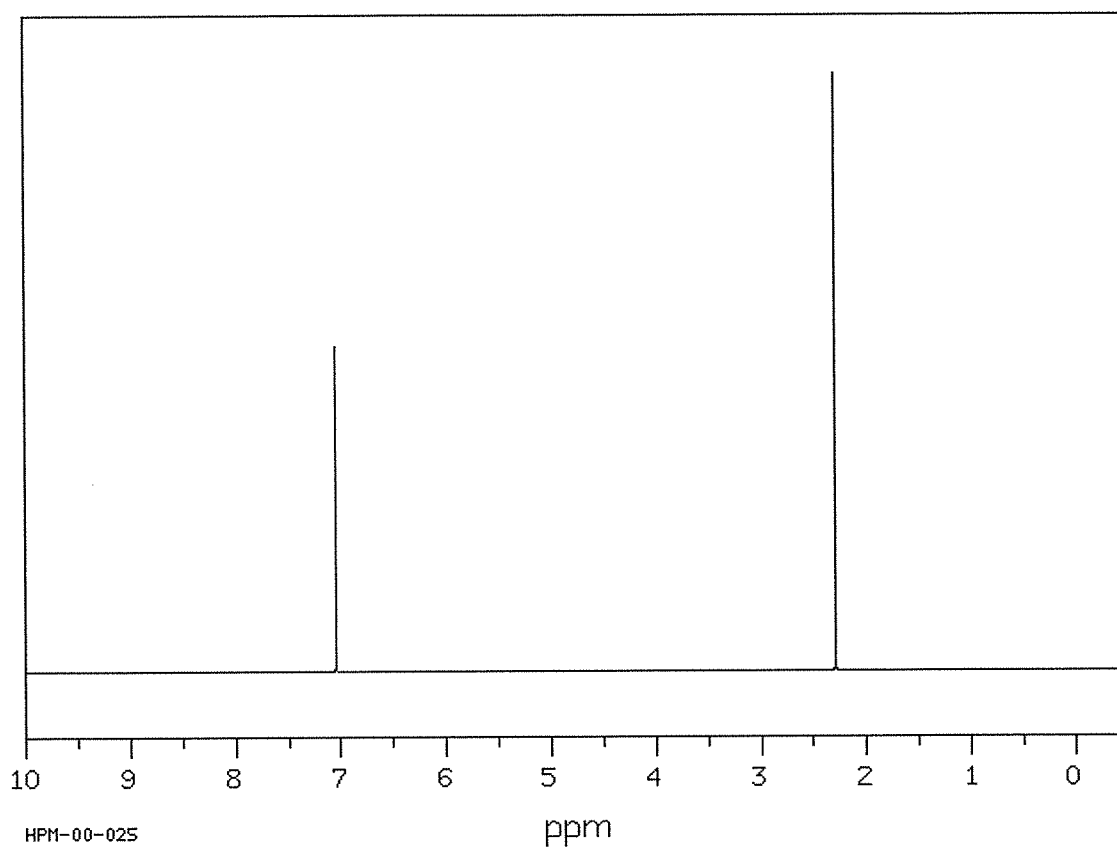
Spettro FT IR in film liquido



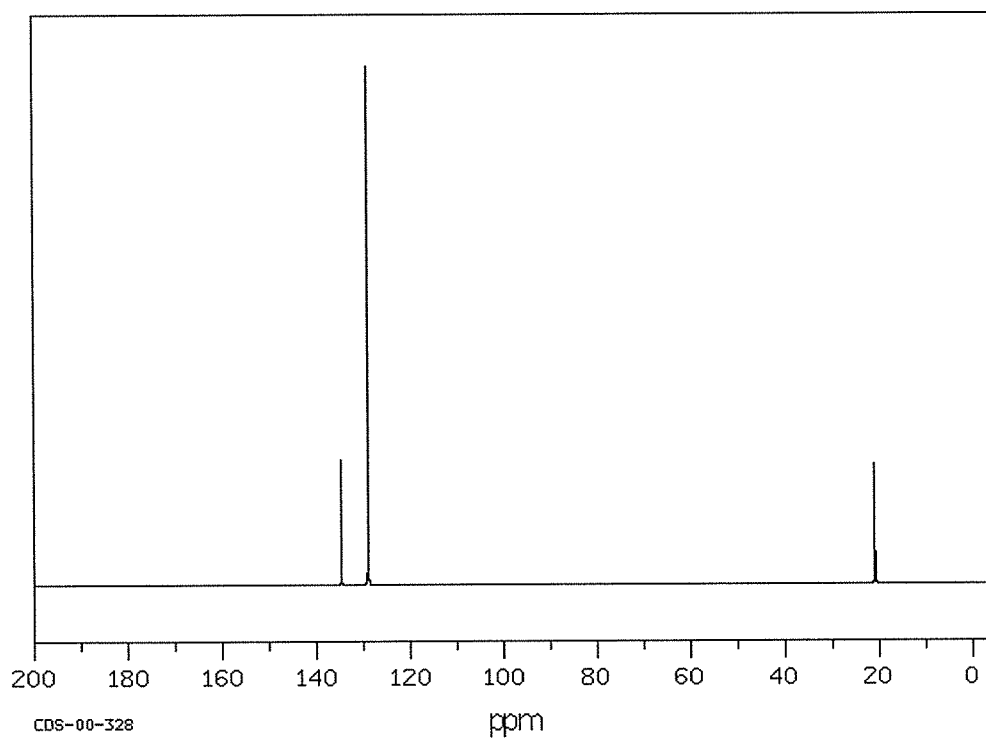
Spettro di massa



Spettro ^1H NMR in CDCl_3



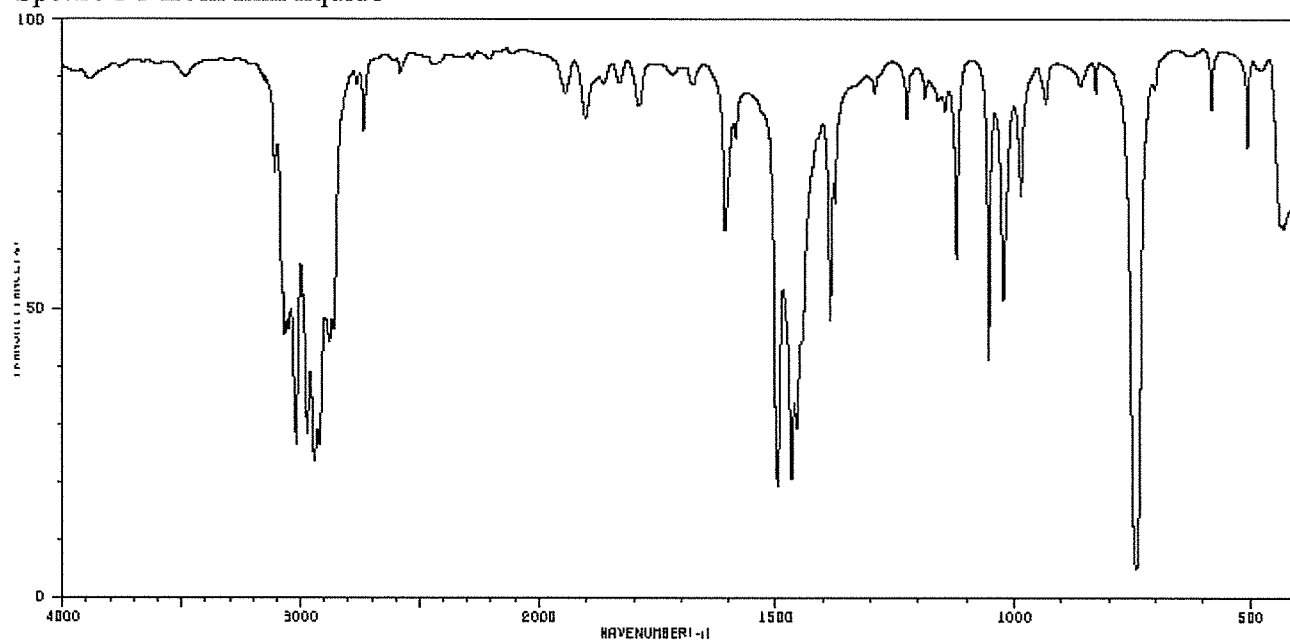
Spettro ^{13}C NMR in CDCl_3



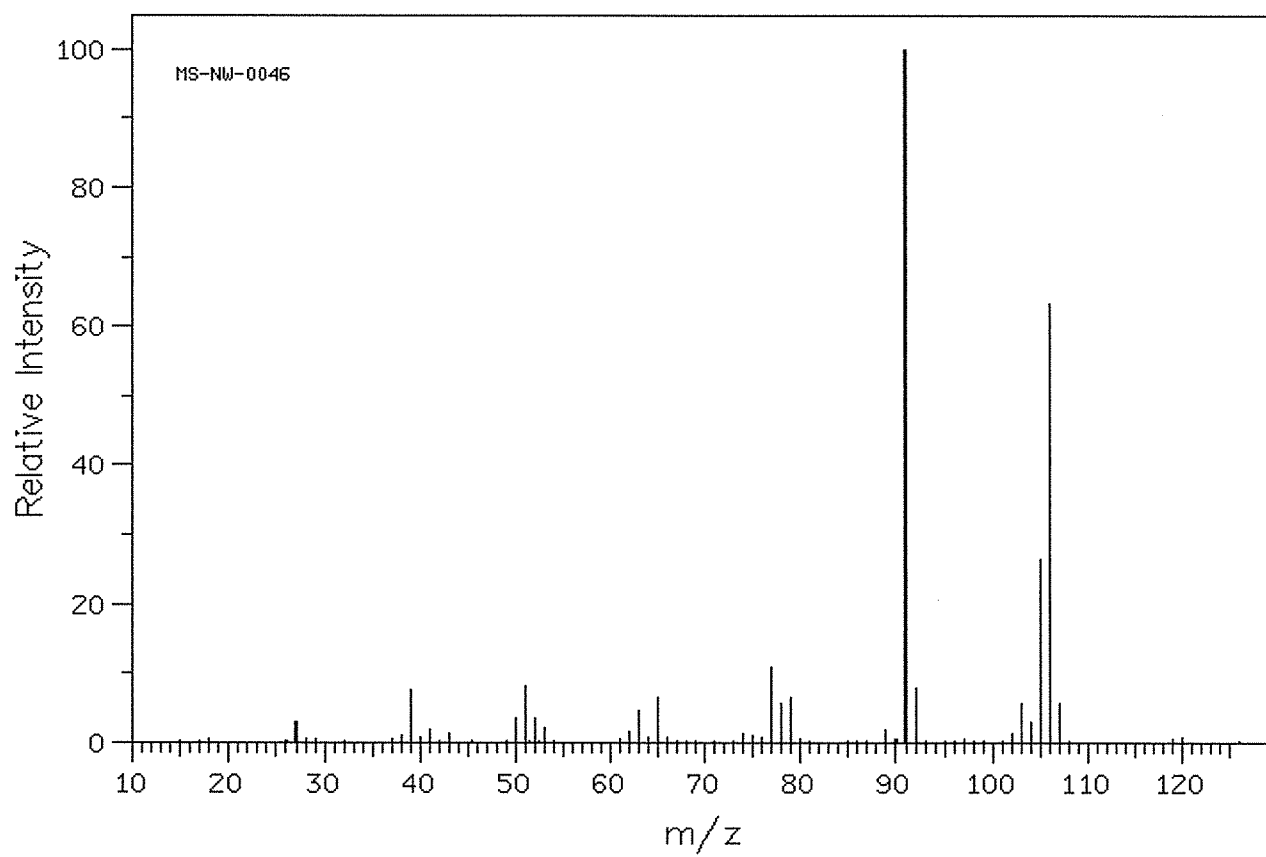
ISOMERO B

CP 14

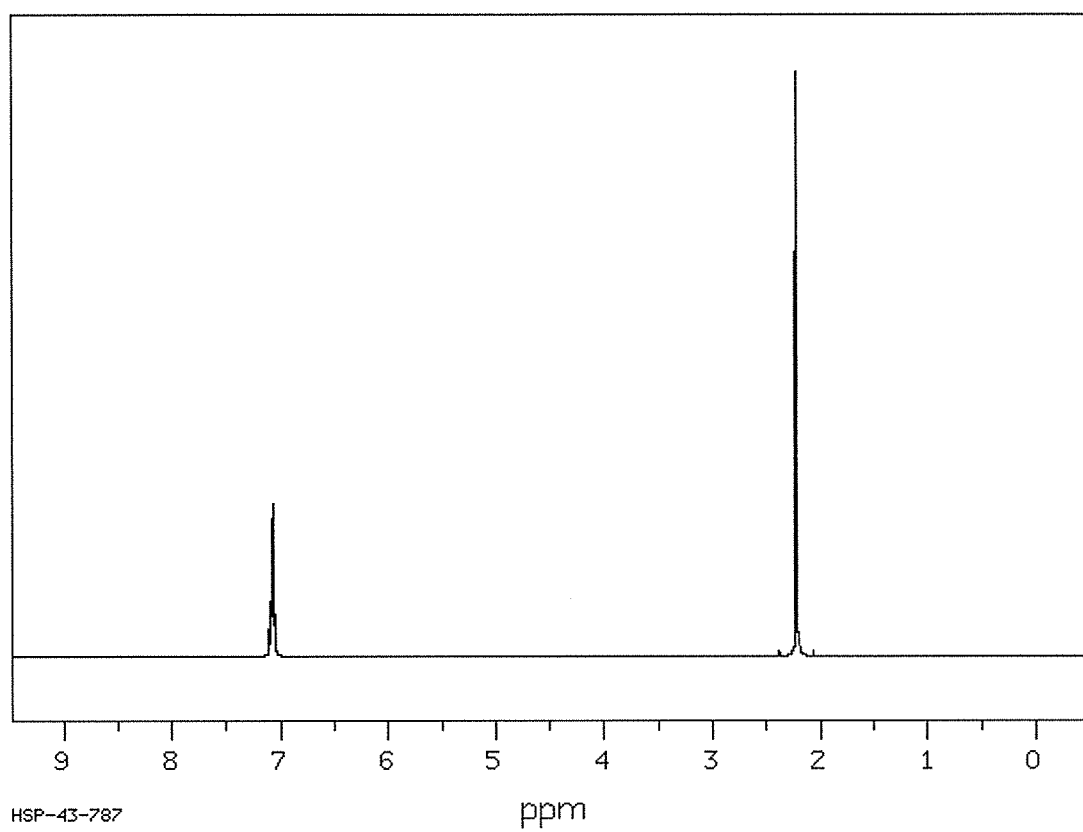
Spettro FT IR in film liquido



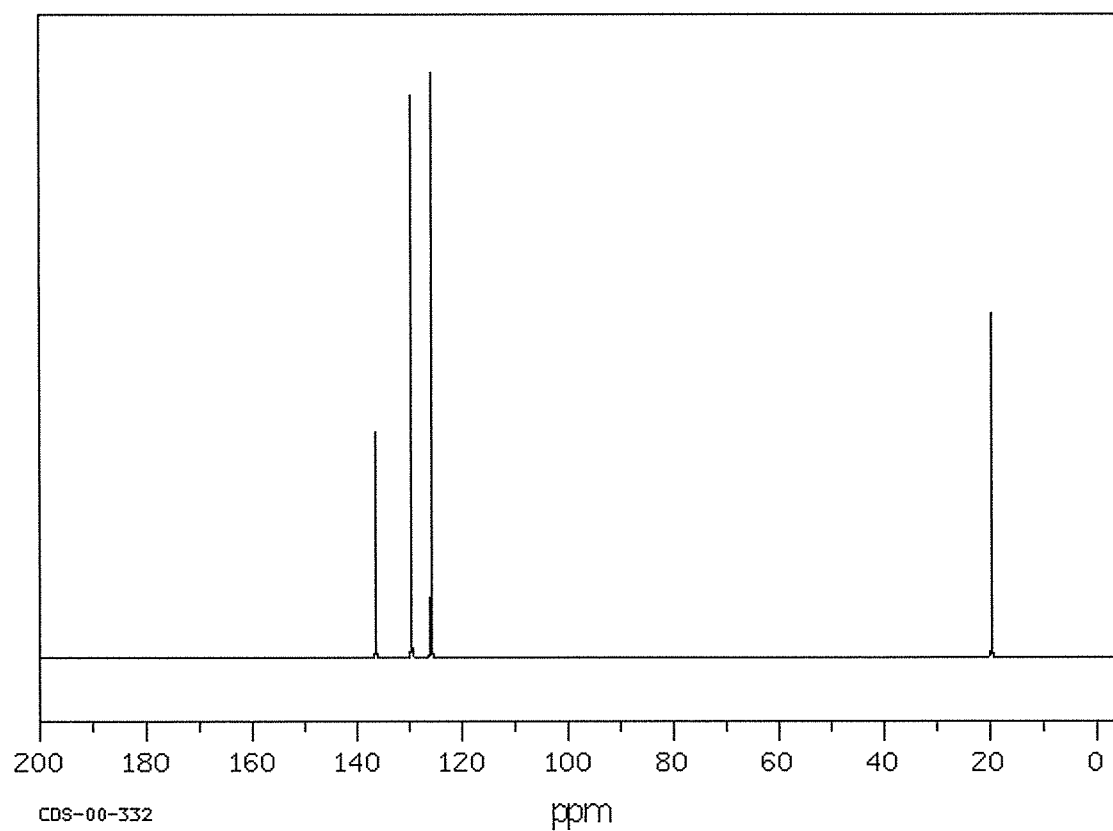
spettro di massa



Spettro ^1H NMR



spettro ^{13}C NMR

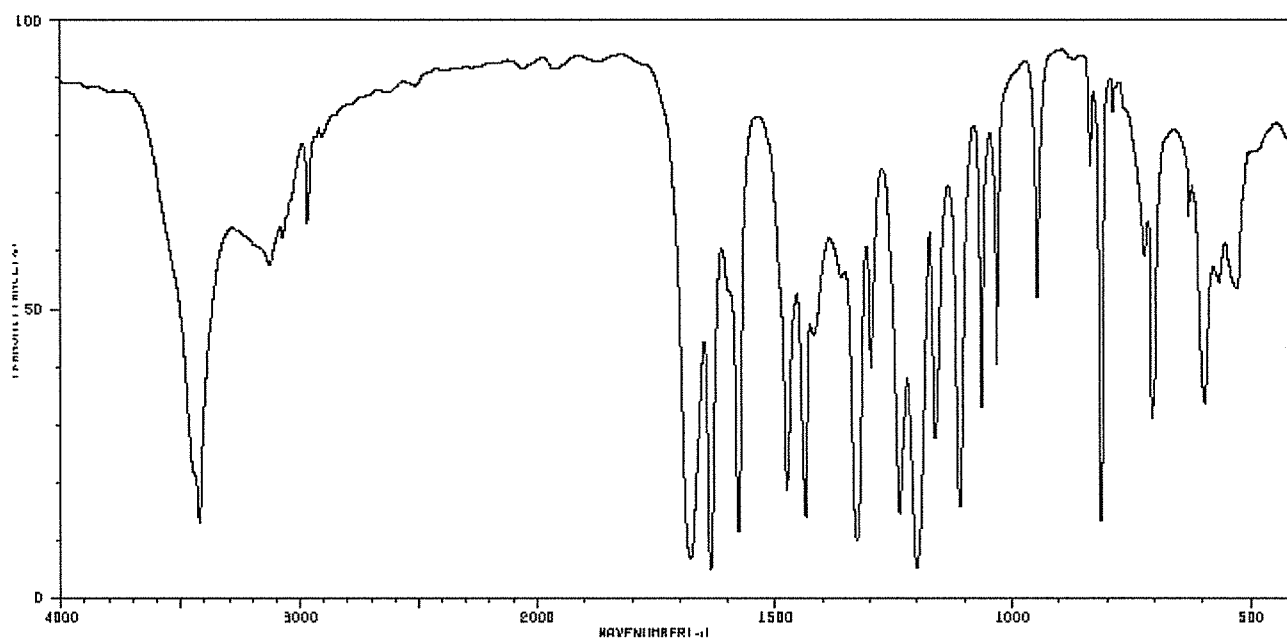


COMPOSTO 6 formula bruta $C_8H_8O_4$

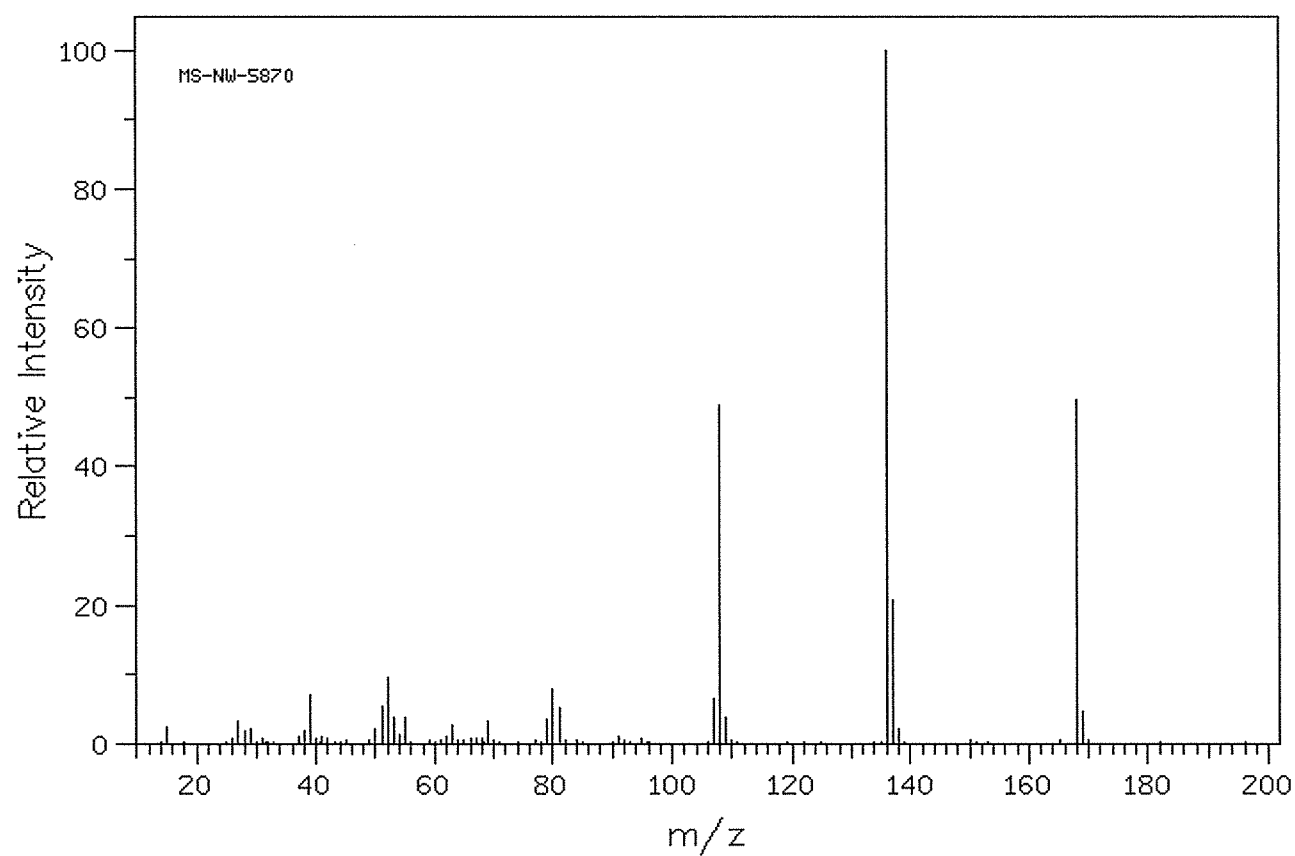
Handwritten signature

Identificare il seguente composto, spiegando le motivazioni e il processo logico seguito

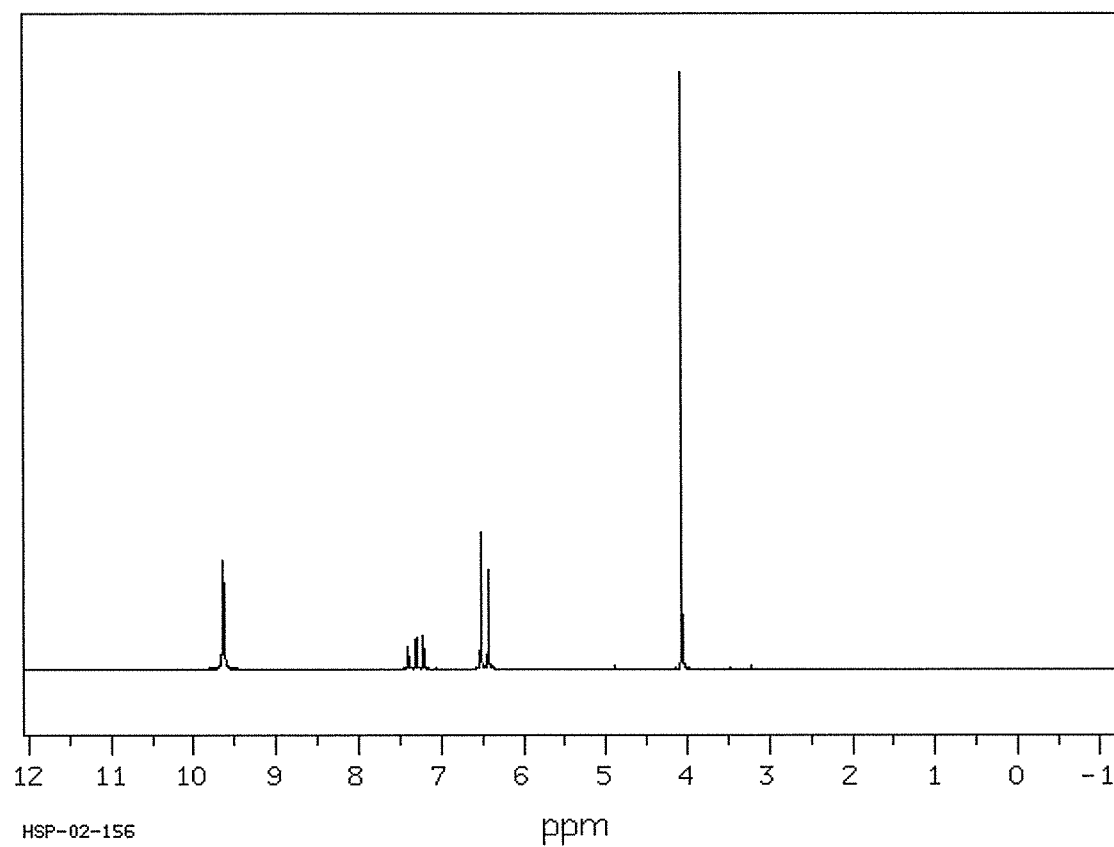
Spettro FT IR in KBr



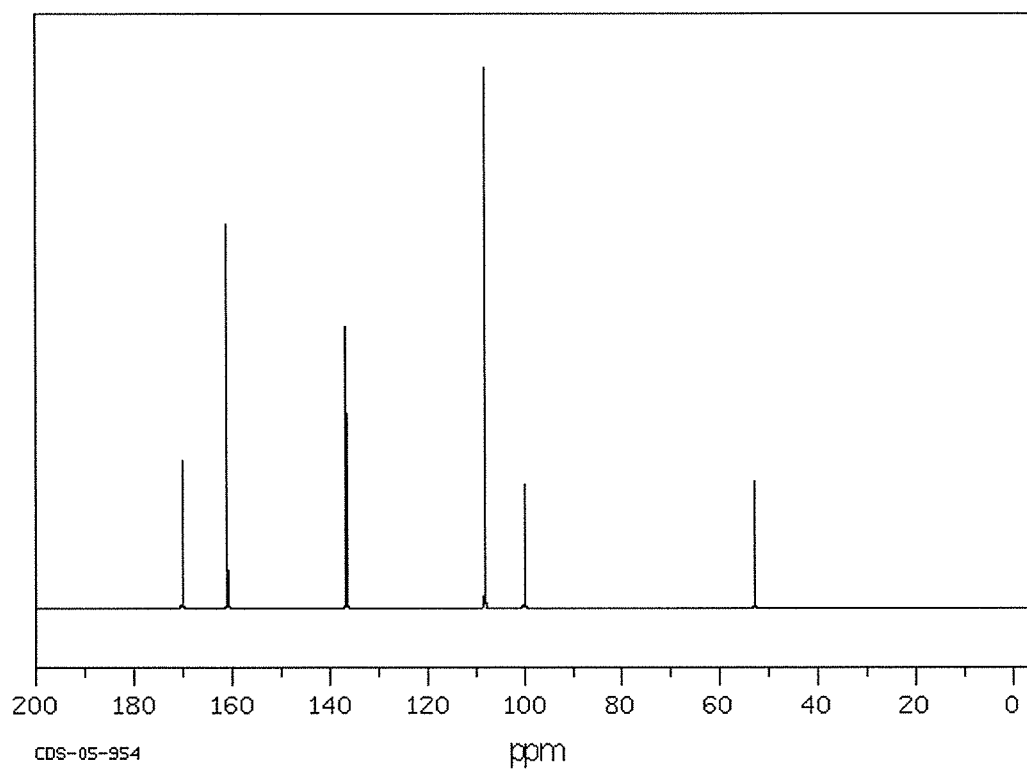
Spettro di massa



spettro ^1H NMR in CDCl_3



spettro ^{13}C NMR

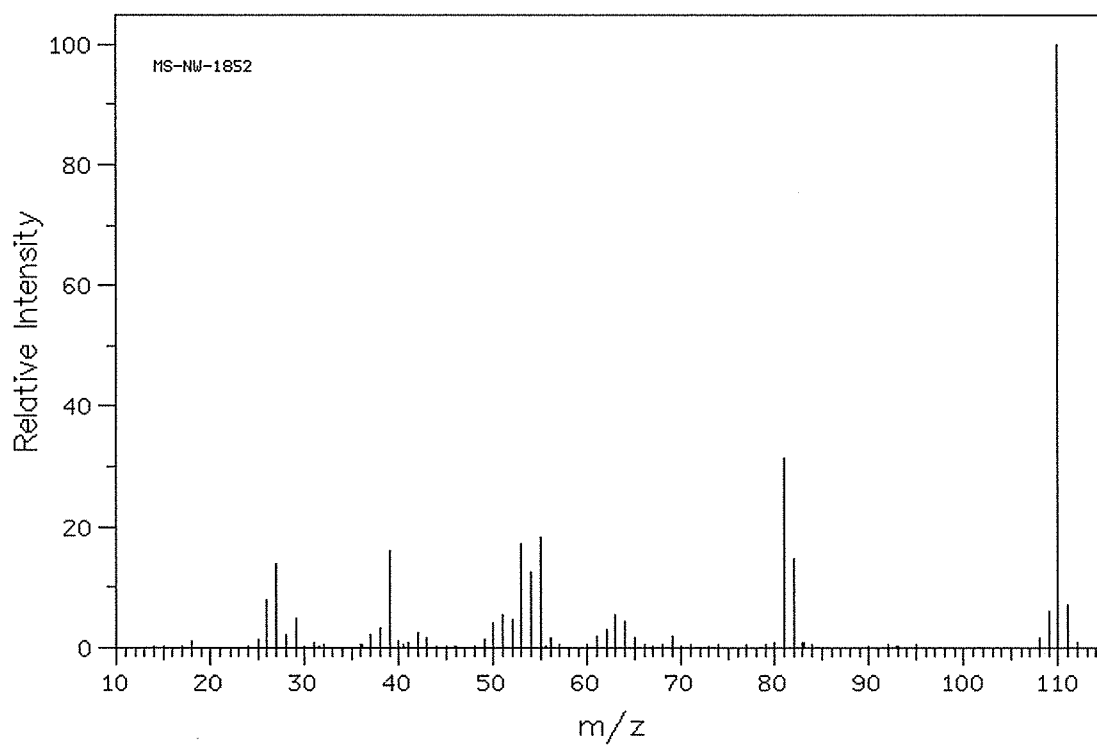


COMPOSTO 3 FORMULA BRUTA C₆H₆O₂

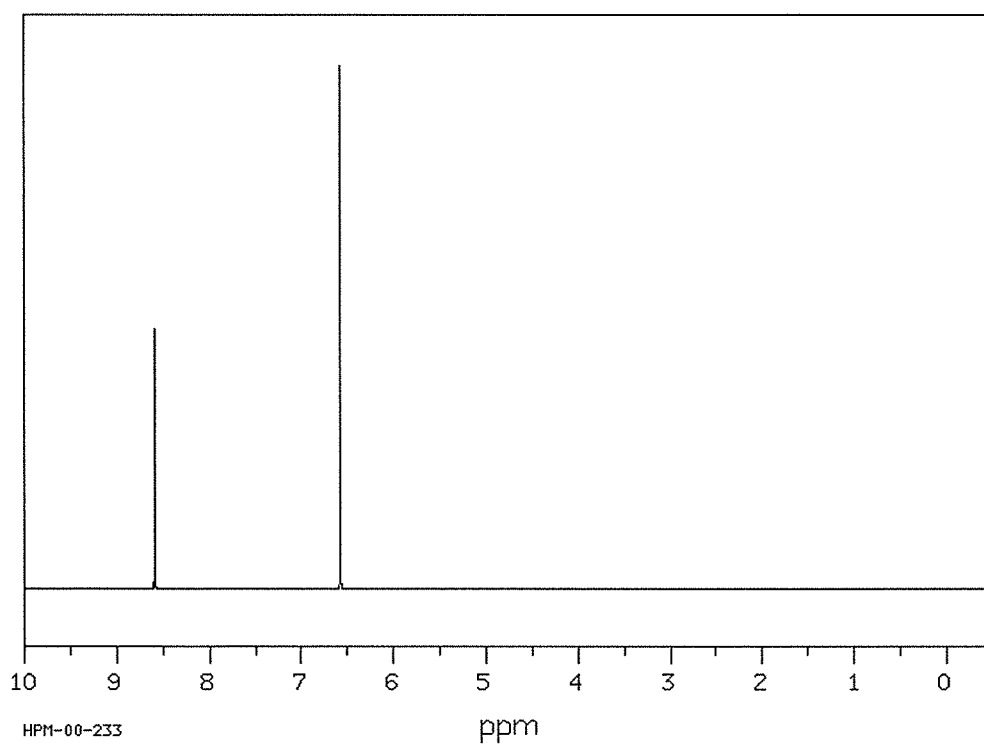
Identificare il composto dai dati presentati.
Distinguere i due isomeri A e B spiegando le attribuzioni

Handwritten signature

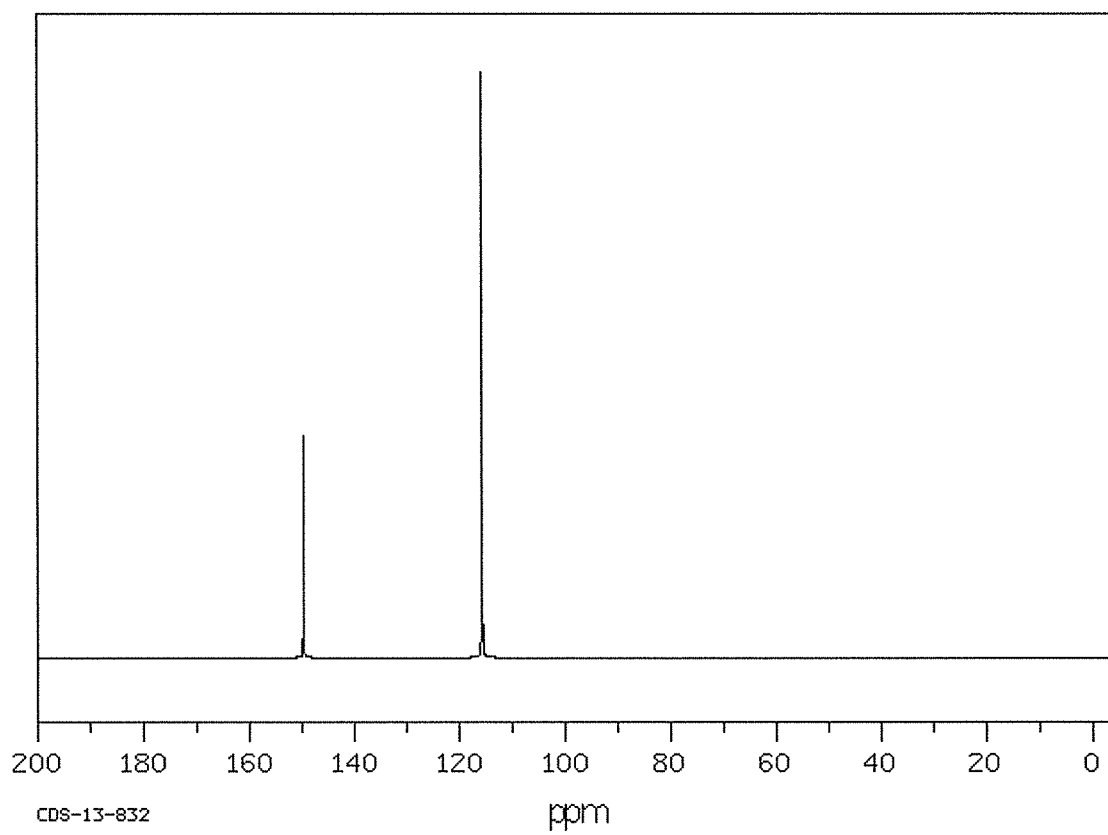
ISOMERO A



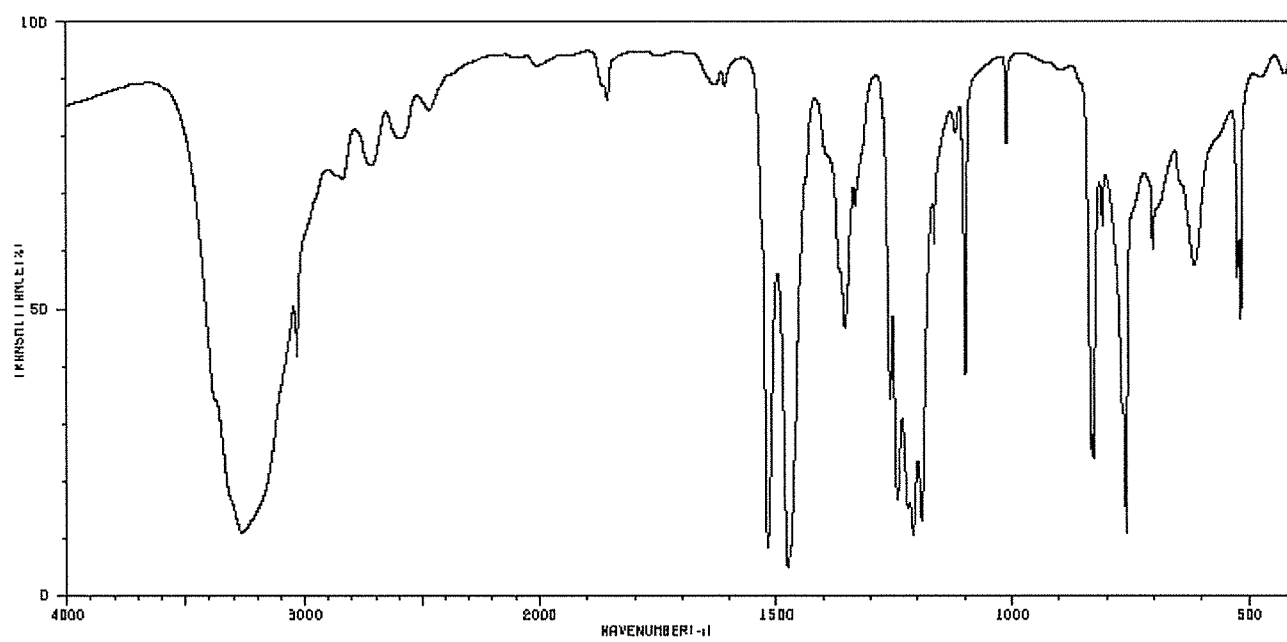
spettro ¹H NMR in DMSO



Spettro ^{13}C NMR in DMSO

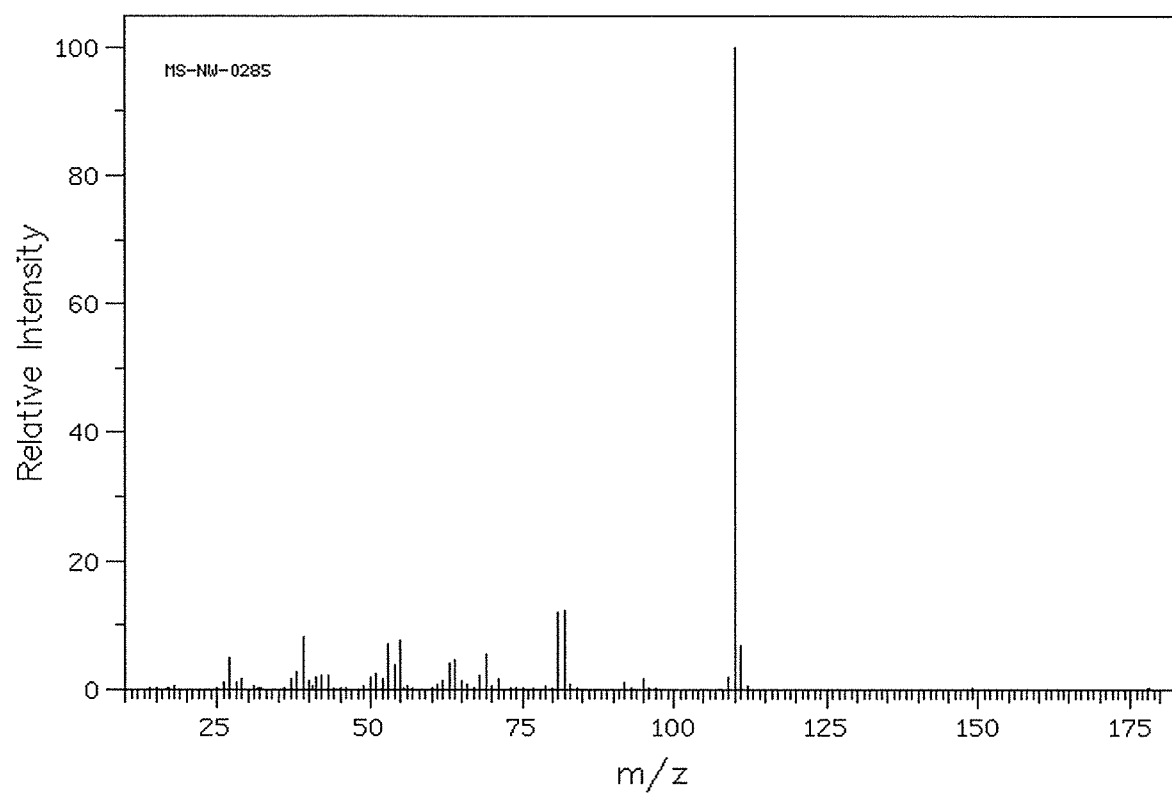


spettro FT IR in KBr

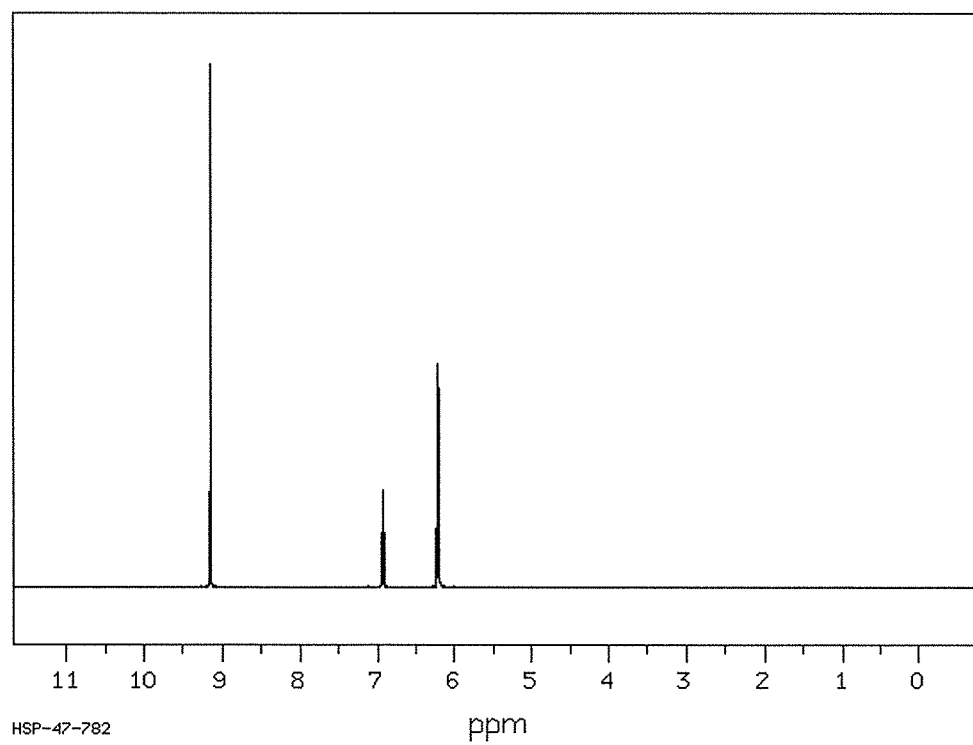


ISOMERO B

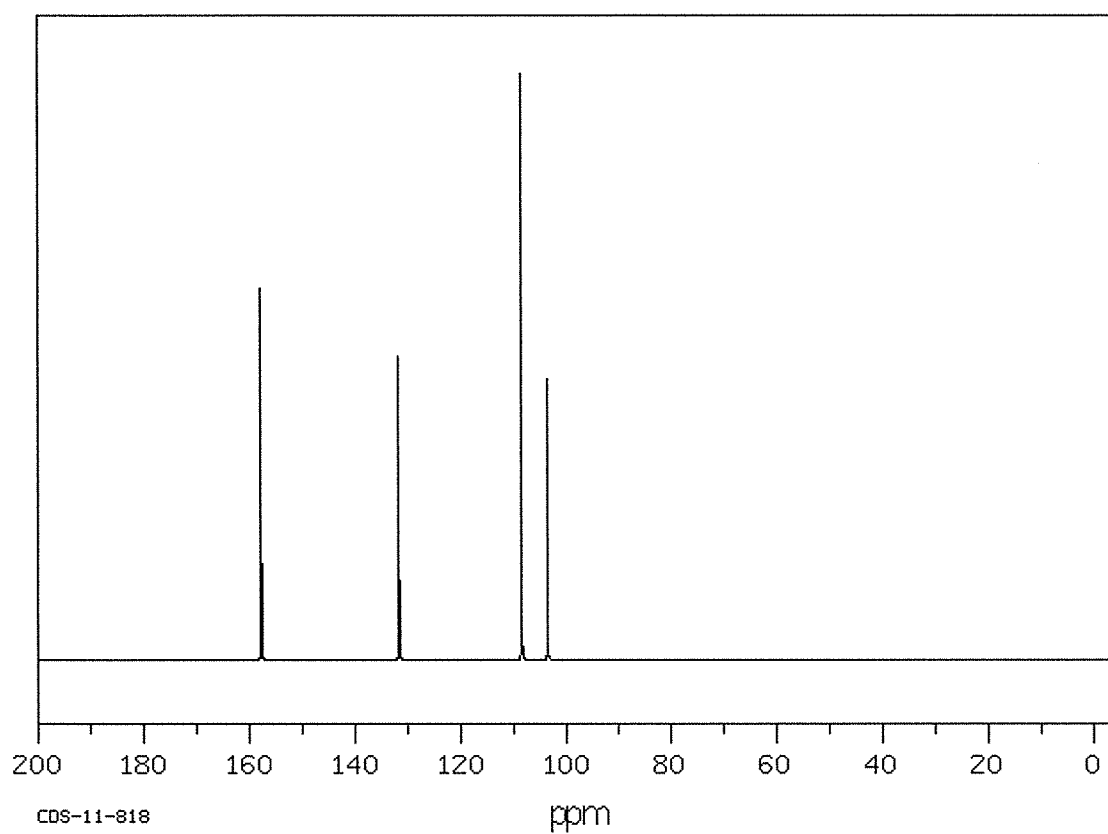
Spettro di massa



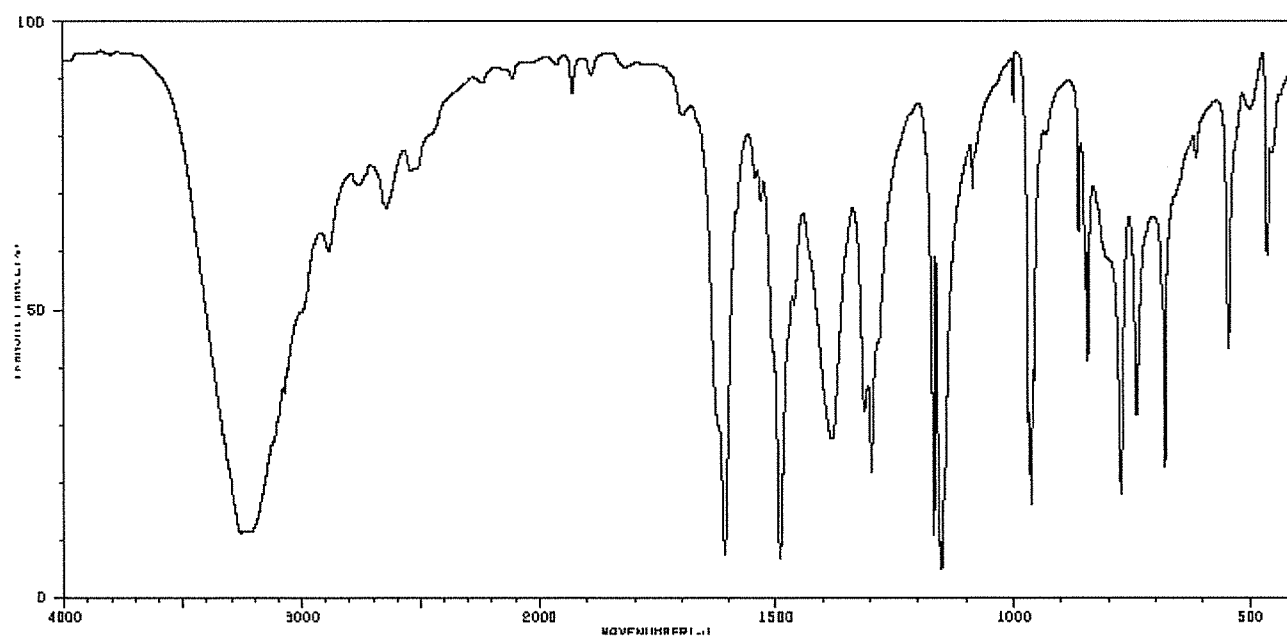
Spettro ^1H NMR in DMSO



spettro 13 C NMR



spettro FT IR in KBr



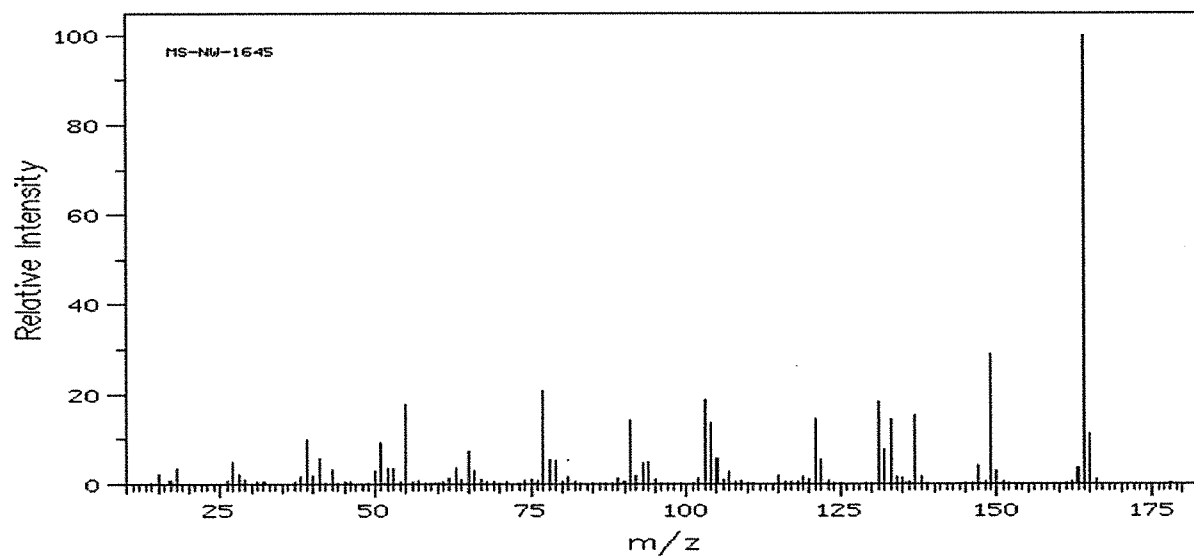
COMPOSTO 8: FORMULA BRUTA C₁₀H₁₂O₂

Handwritten signature

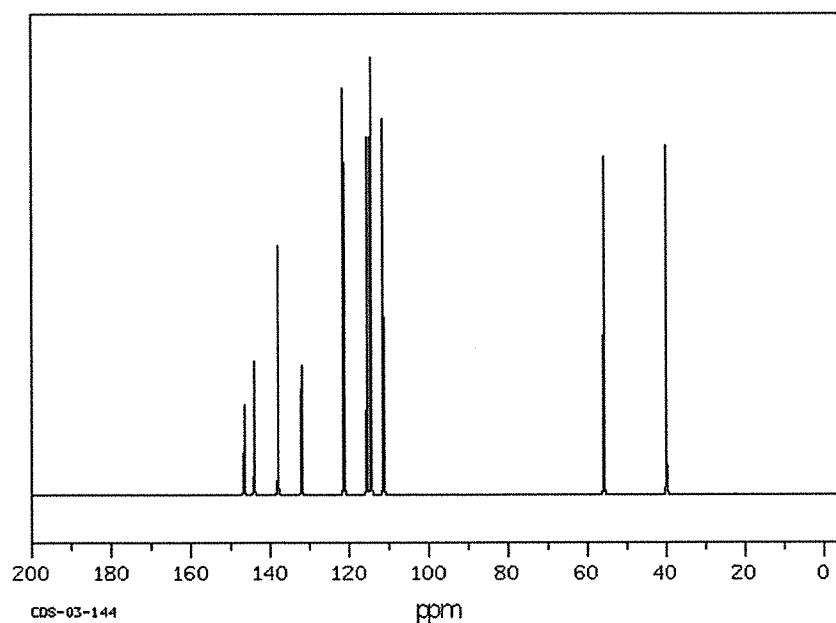
Identificare il composto dai dati presentati.

MS (EI)

C₁₀H₁₂O₂ (Mass of molecular ion: 164)



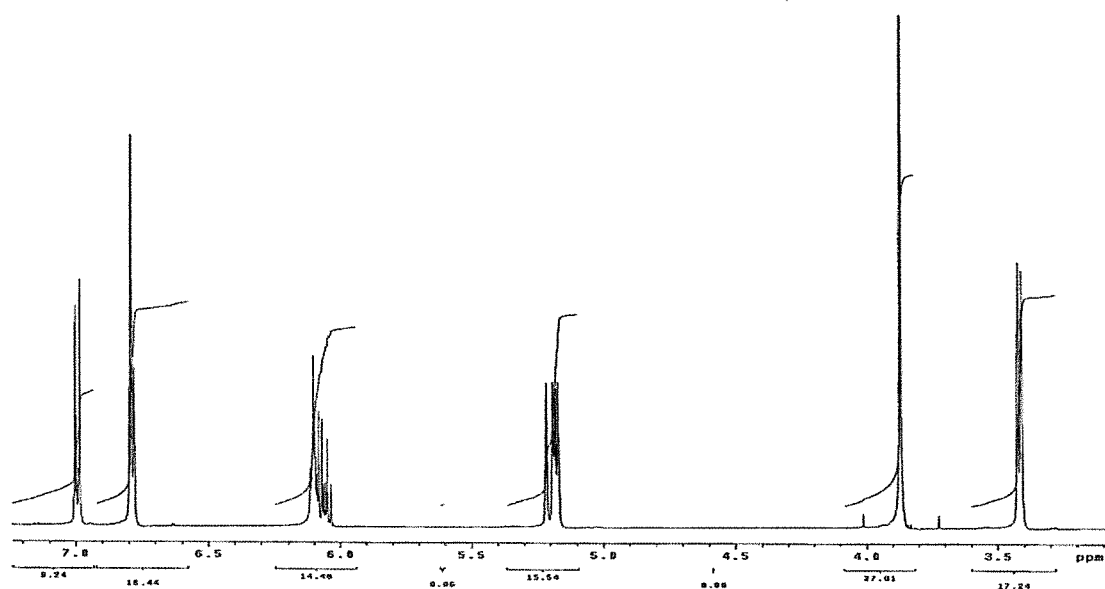
spettro ¹³C NMR (CDCl₃, 15.09 MHz, 20% vol)



ppm Int. Assign.

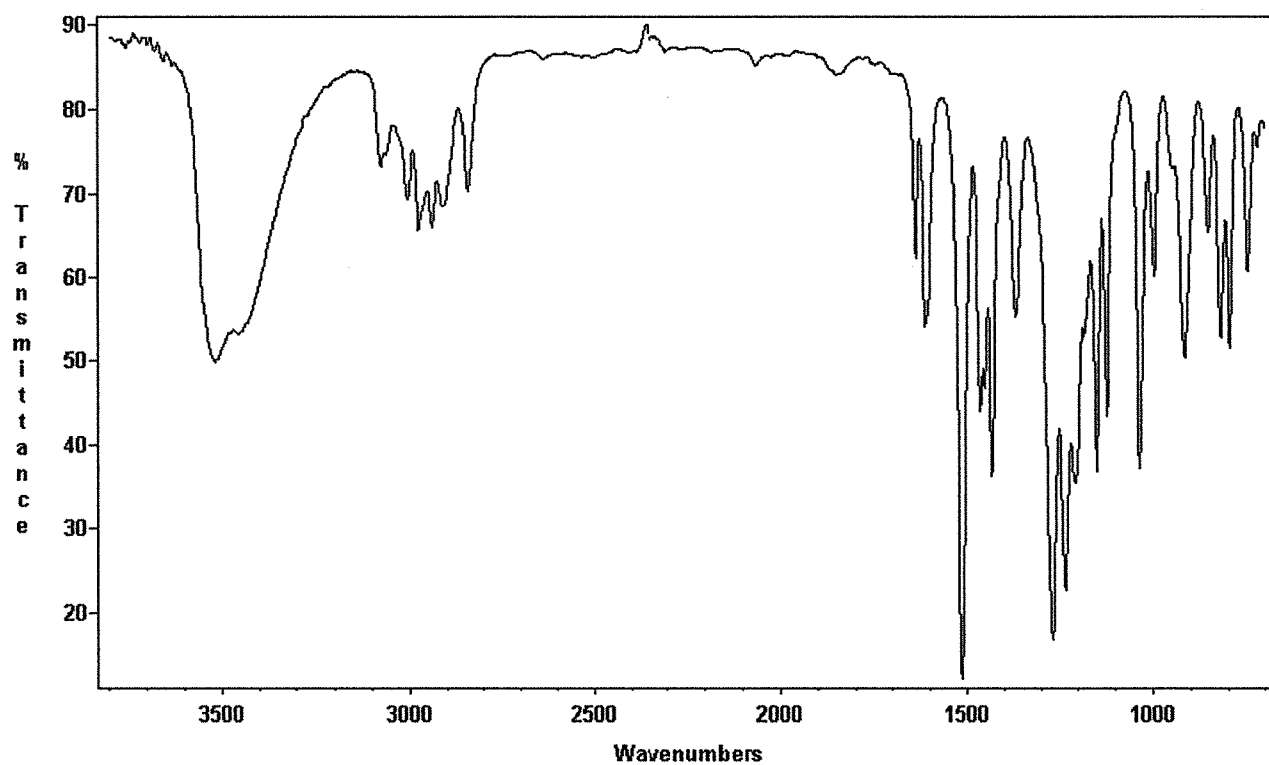
146.60	205	1
144.03	305	2
137.91	567	3
131.94	295	4
121.26	929	5
115.49	814	6
114.46	1000	7
111.28	857	8
55.84	771	9
39.92	795	10

^1H NMR (399.65 MHz; CDCl_3)



Shift (ppm)	Integral	Shift (ppm)	Integral	Shift (ppm)	Integral
6.832	1	5.933	1	5.039	1
6.66	1	5.73	1	3.801	3
6.65	1	5.058	1	3.291	2

IR Spectrum (liquid film)



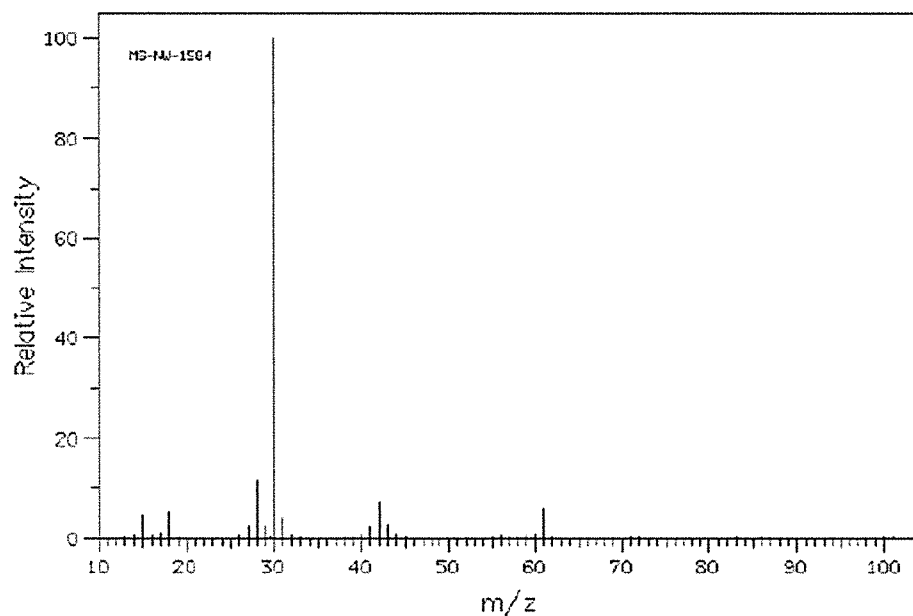
COMPOSTO 7: FORMULA BRUTA C_2H_7NO

Identificare il composto dai dati presentati.

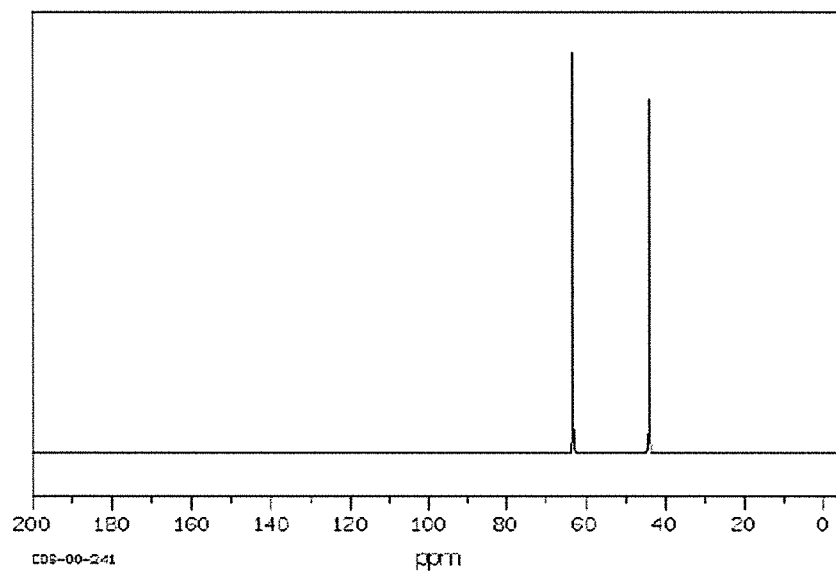
Spettro di massa (EI, 75 eV)

(Mass of molecular ion: 61)

C_2H_7NO (Mass of molecular ion: 61)

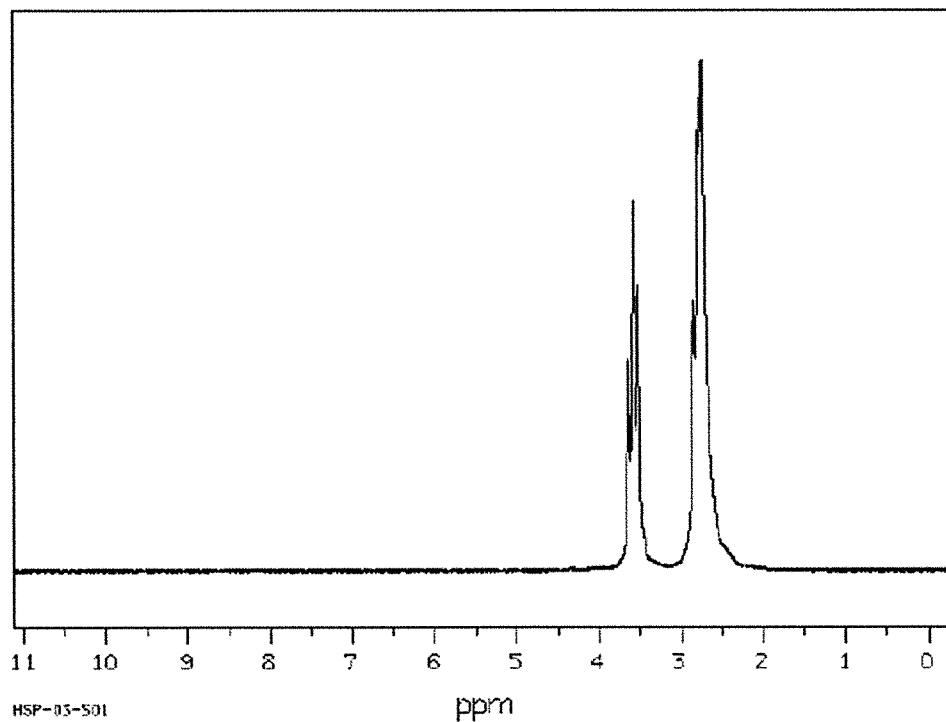


Spettro ^{13}C NMR ($CDCl_3$, 16 MHz)



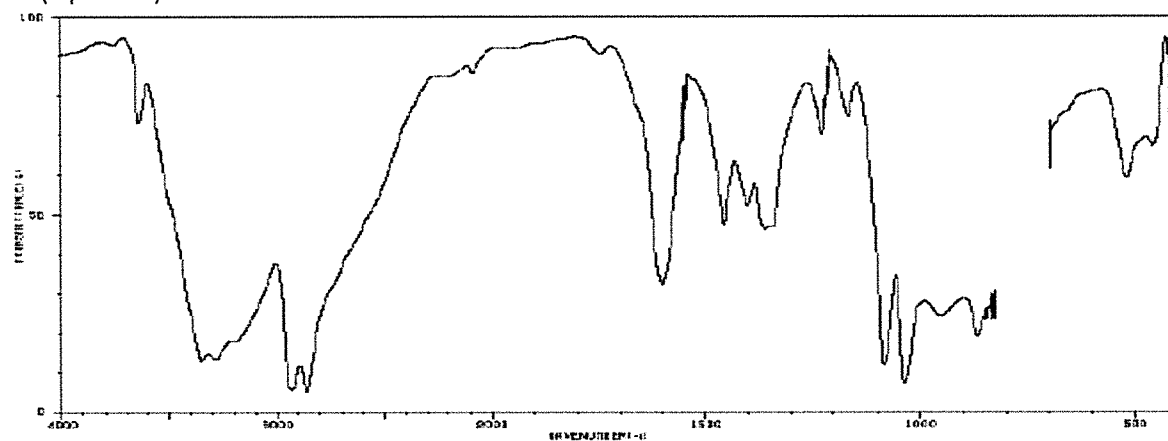
63.18	1000	2
43.96	883	1

^1H NMR (CDCl_3 , 90 MHz)



^1H NMR: 3.56 ppm (2H); 2.78 ppm (2H); 2.76 ppm (2.76)

IR (liquid film)



3642	70	1664	66	1226	68	856	19
3351	12	1619	74	1220	70	819	29
3200	12	1437	44	1212	79	647	22
2999	6	1402	50	1166	72	623	22
2853	4	1363	34	1065	11	616	65
2800	81	1354	44	1038	5	519	57
1601	31	1344	44	661	23	467	64

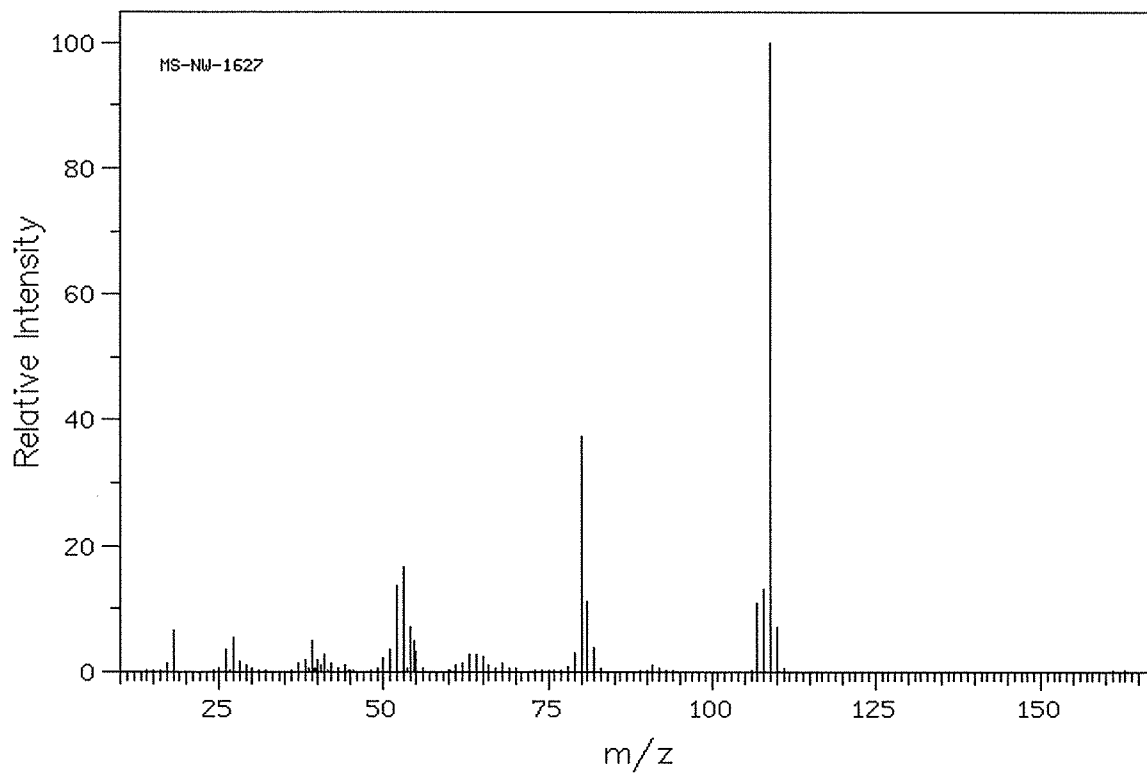
COMPOSTO 1: FORMULA BRUTA C_6H_7NO

[Handwritten signature]

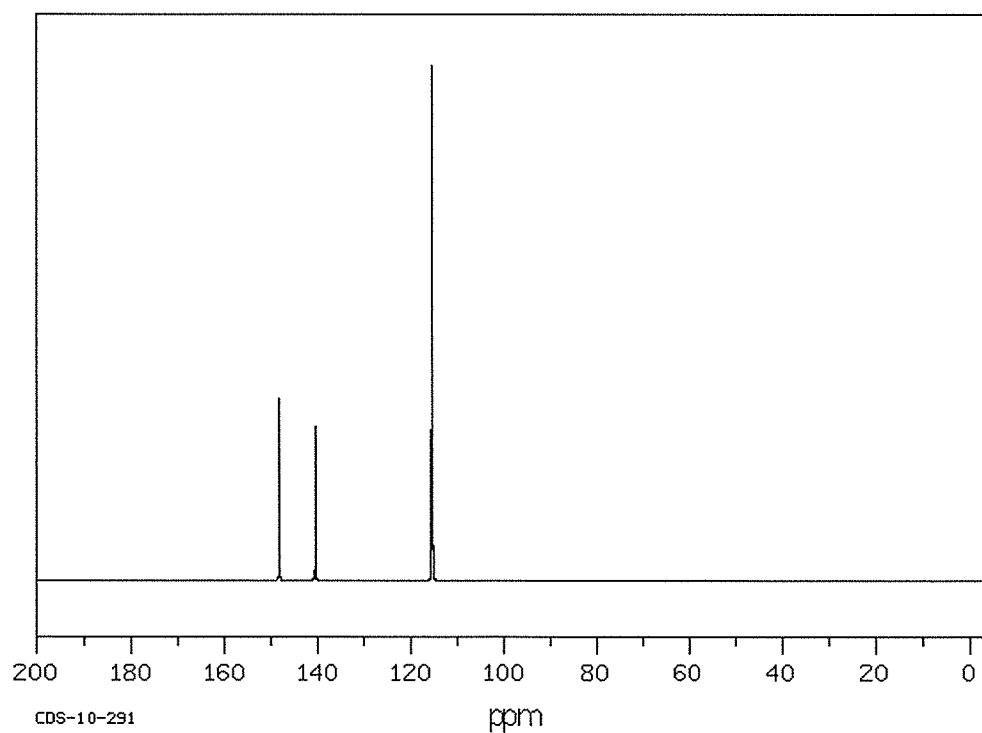
Identificare il composto dai dati presentati.

Distinguere i due isomeri A e B spiegando le attribuzioni

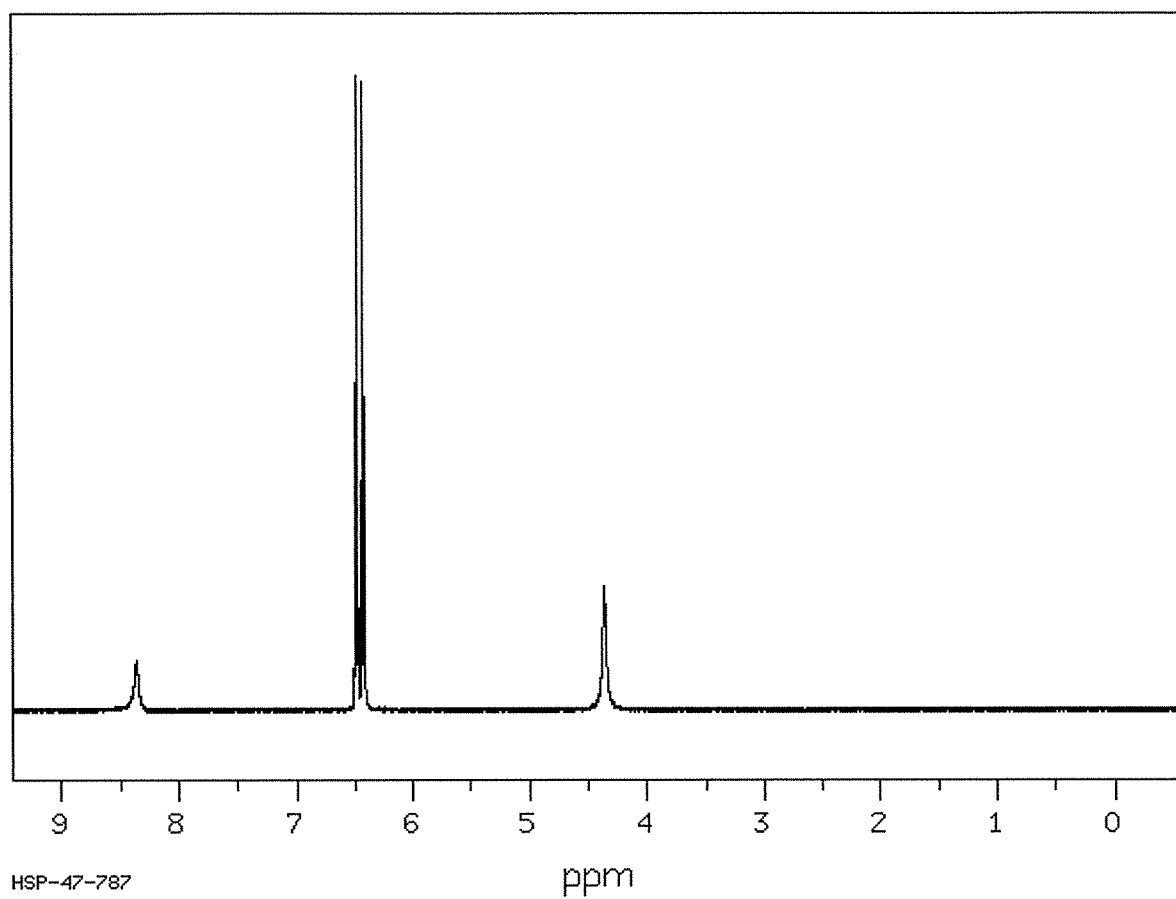
ISOMERO A) spettro di massa



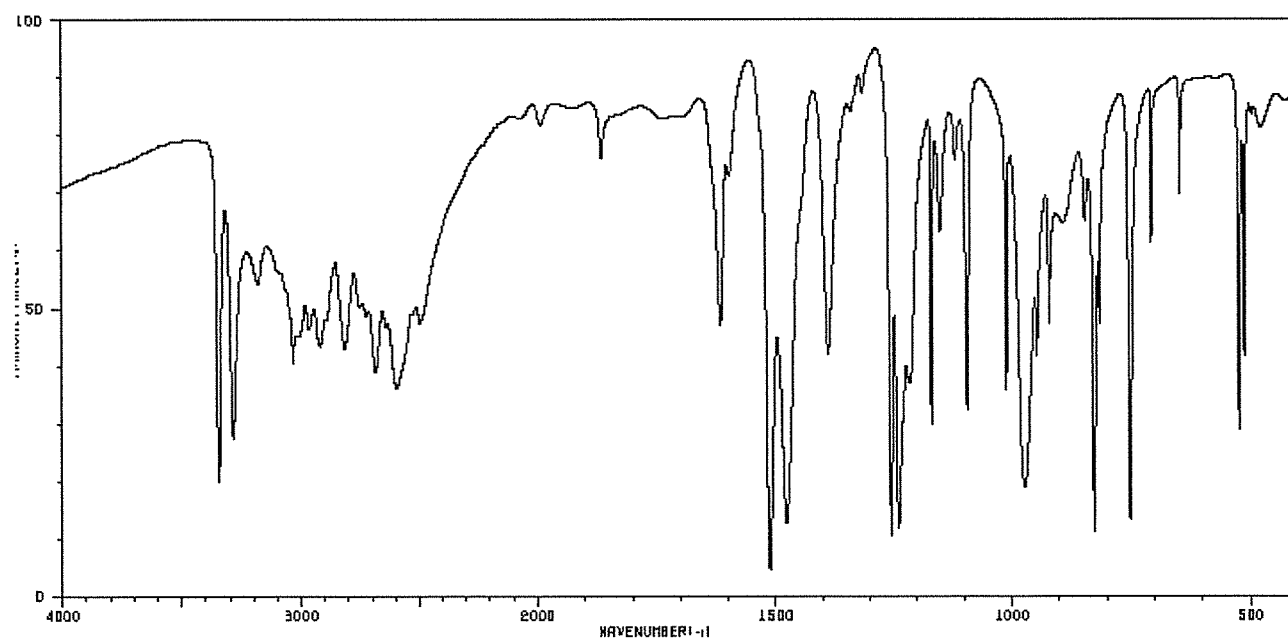
spettro ^{13}C NMR



spettro ^1H NMR



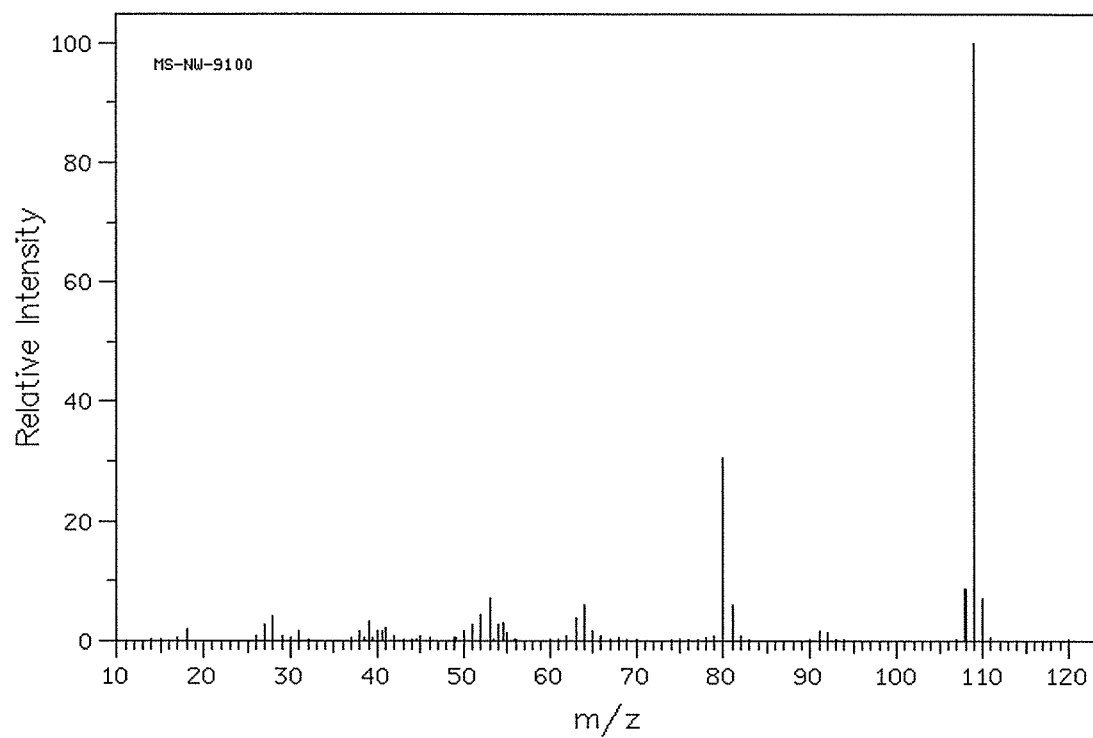
spettro FT IR



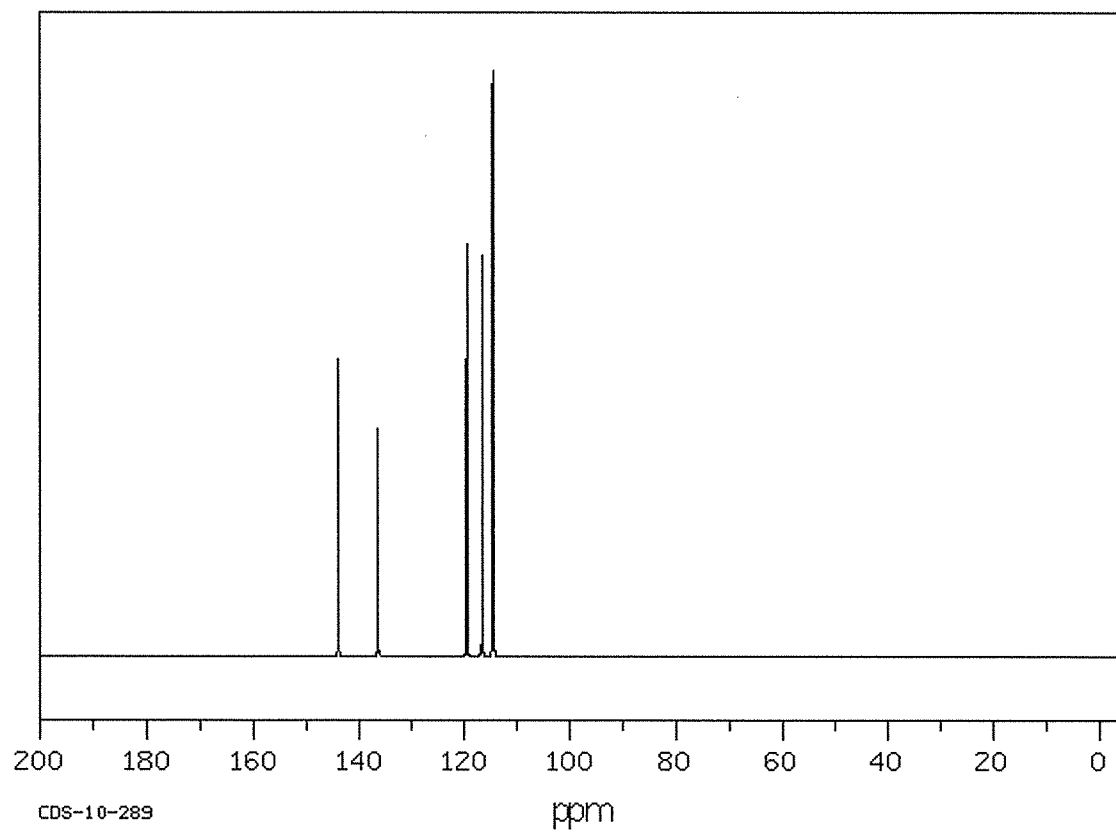
50
PD

ISOMERO B

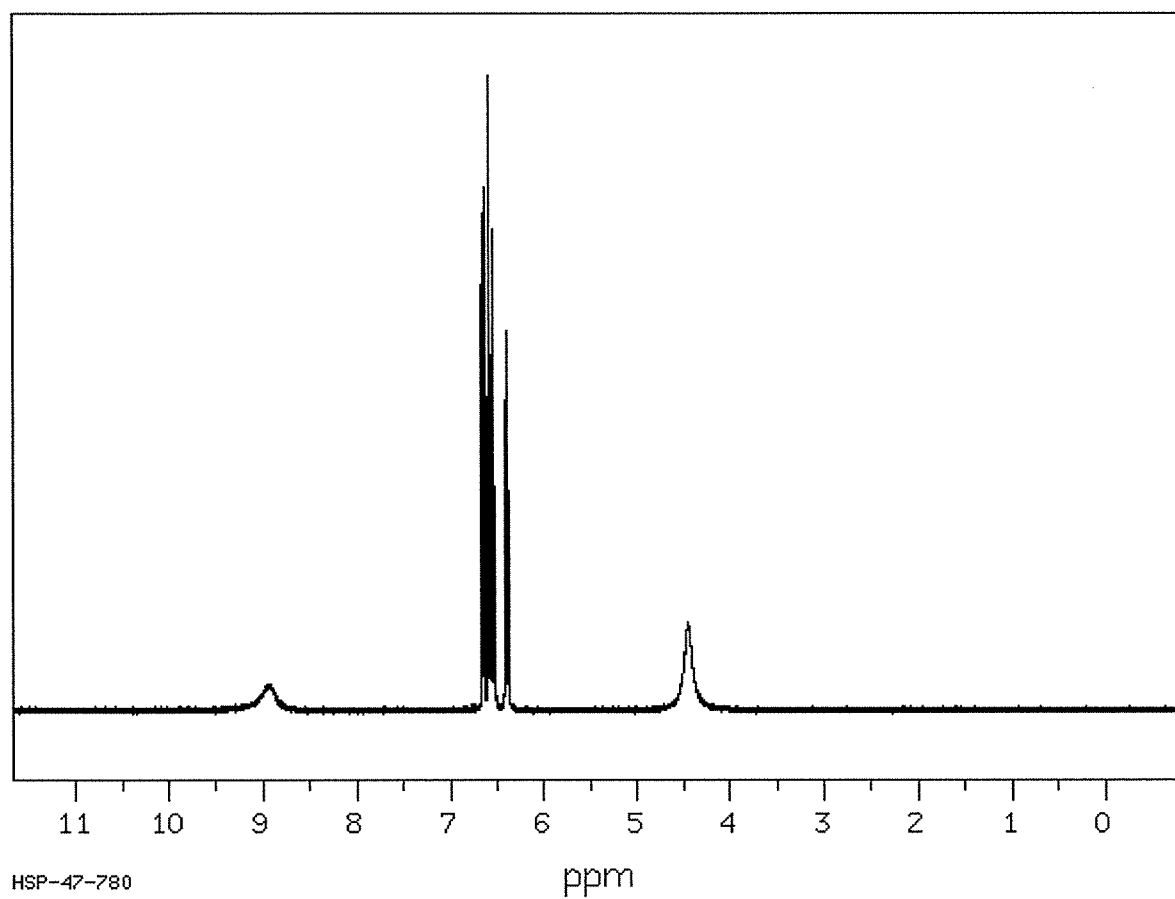
Spettro di massa



Spettro ^{13}C NMR in DMSO



Spettro ^1H NMR in DMSO



Spettro FT IR in KBr

