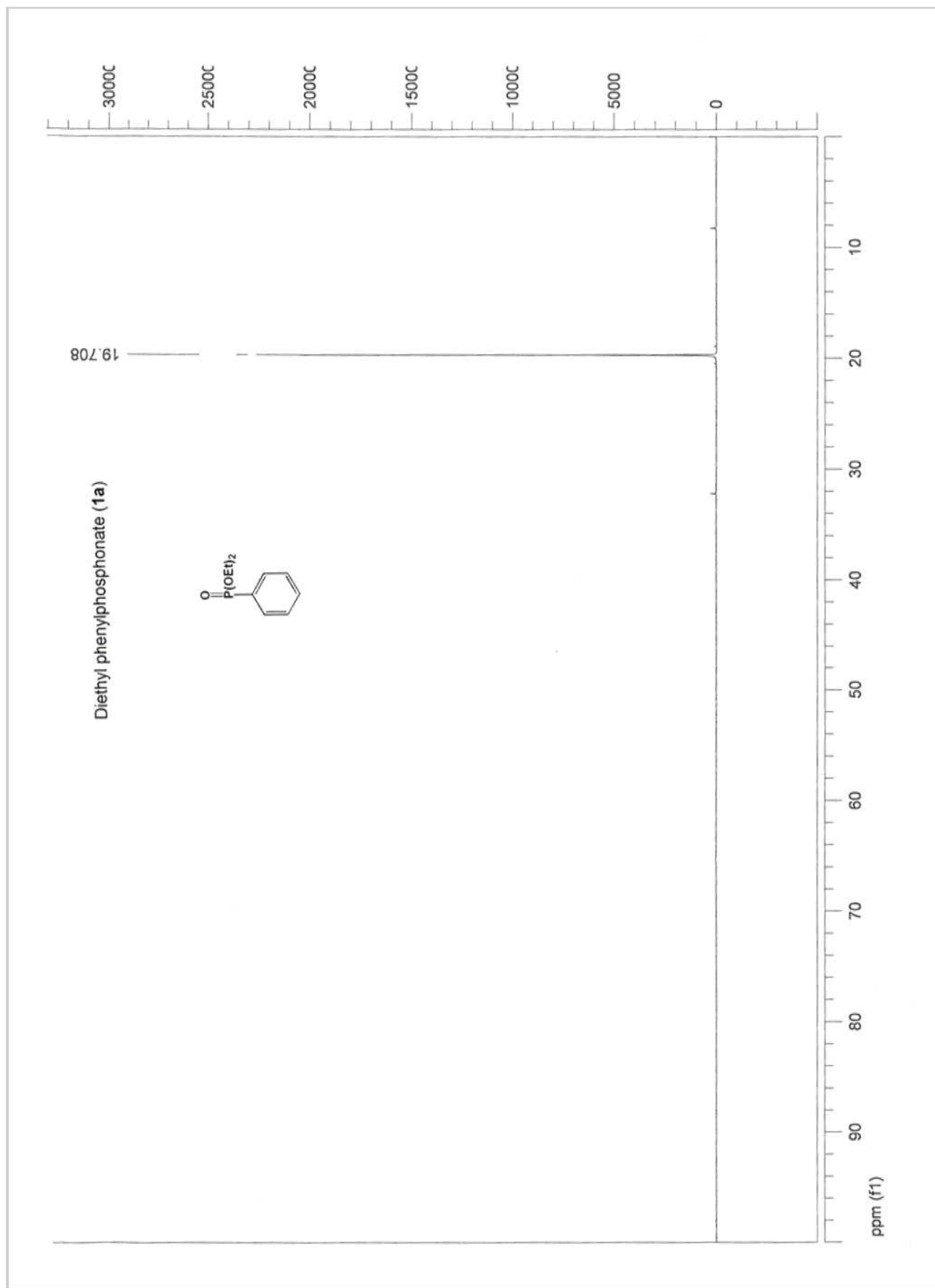


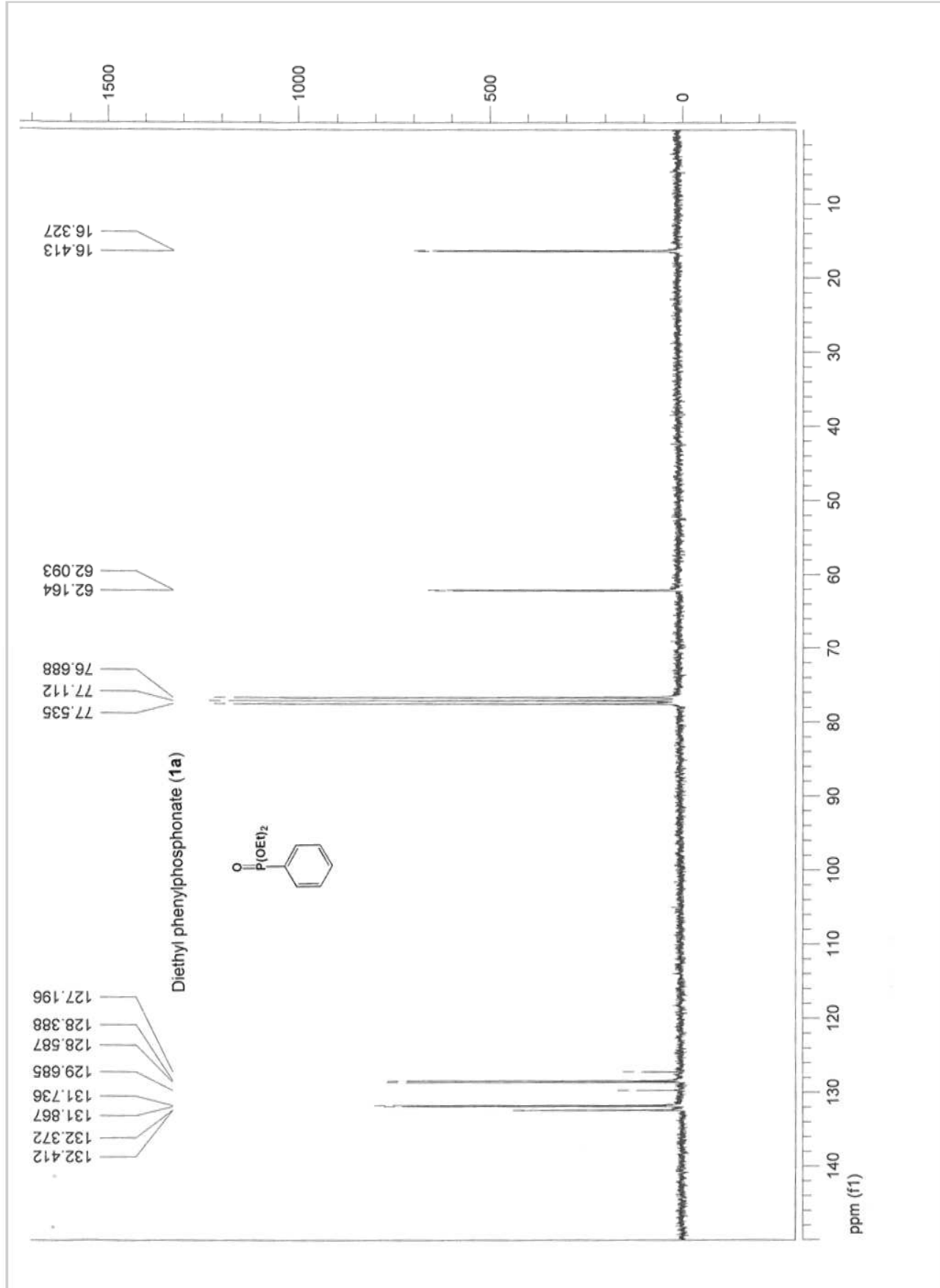
Supplementary Information

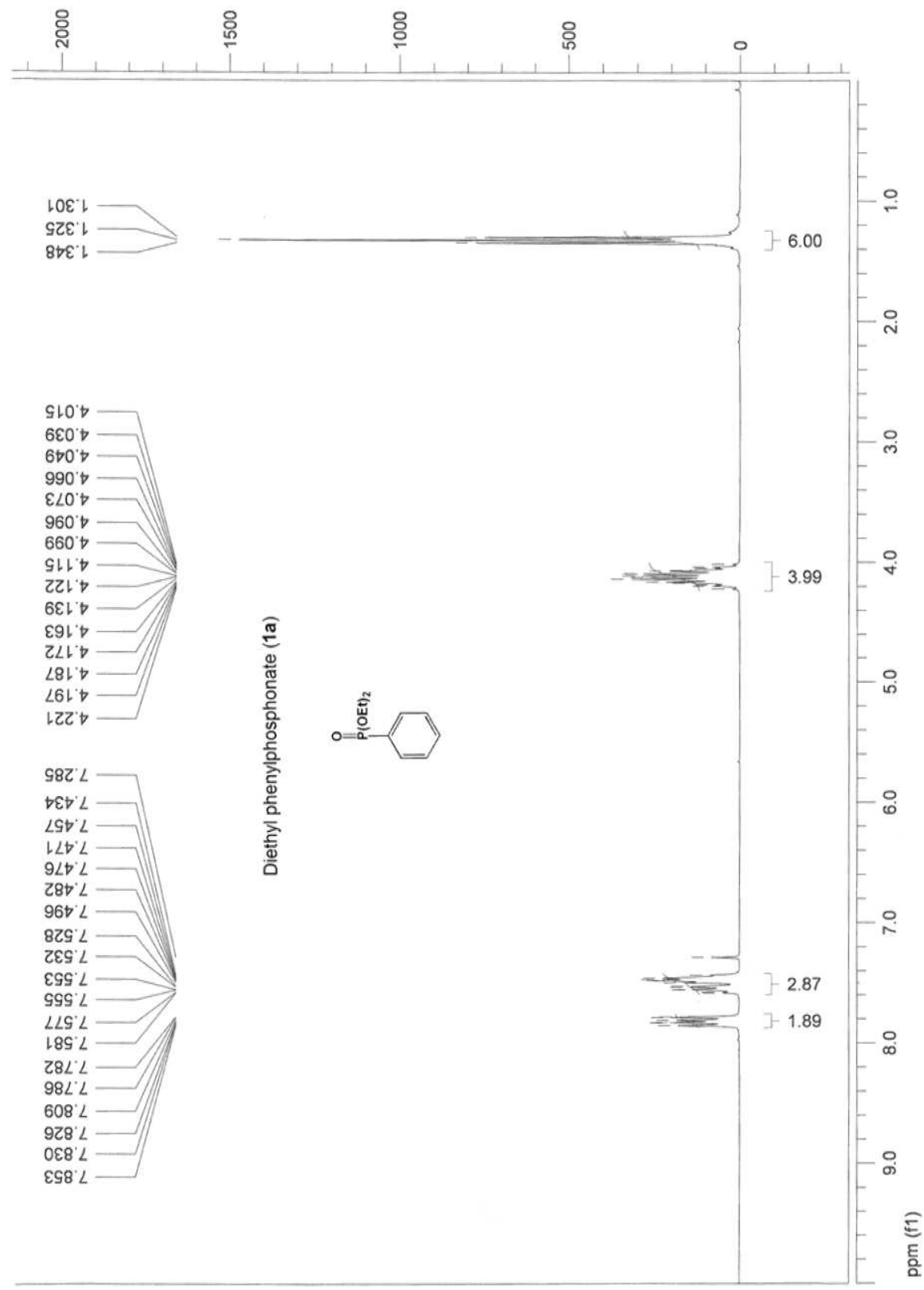
A “green” variation of the Hirao reaction: the P–C coupling of diethyl phosphite, alkyl phenyl-*H*-phosphinates and secondary phosphine oxides with bromoarenes using P-ligand-free Pd(OAc)₂ catalyst under microwave and solvent-free conditions

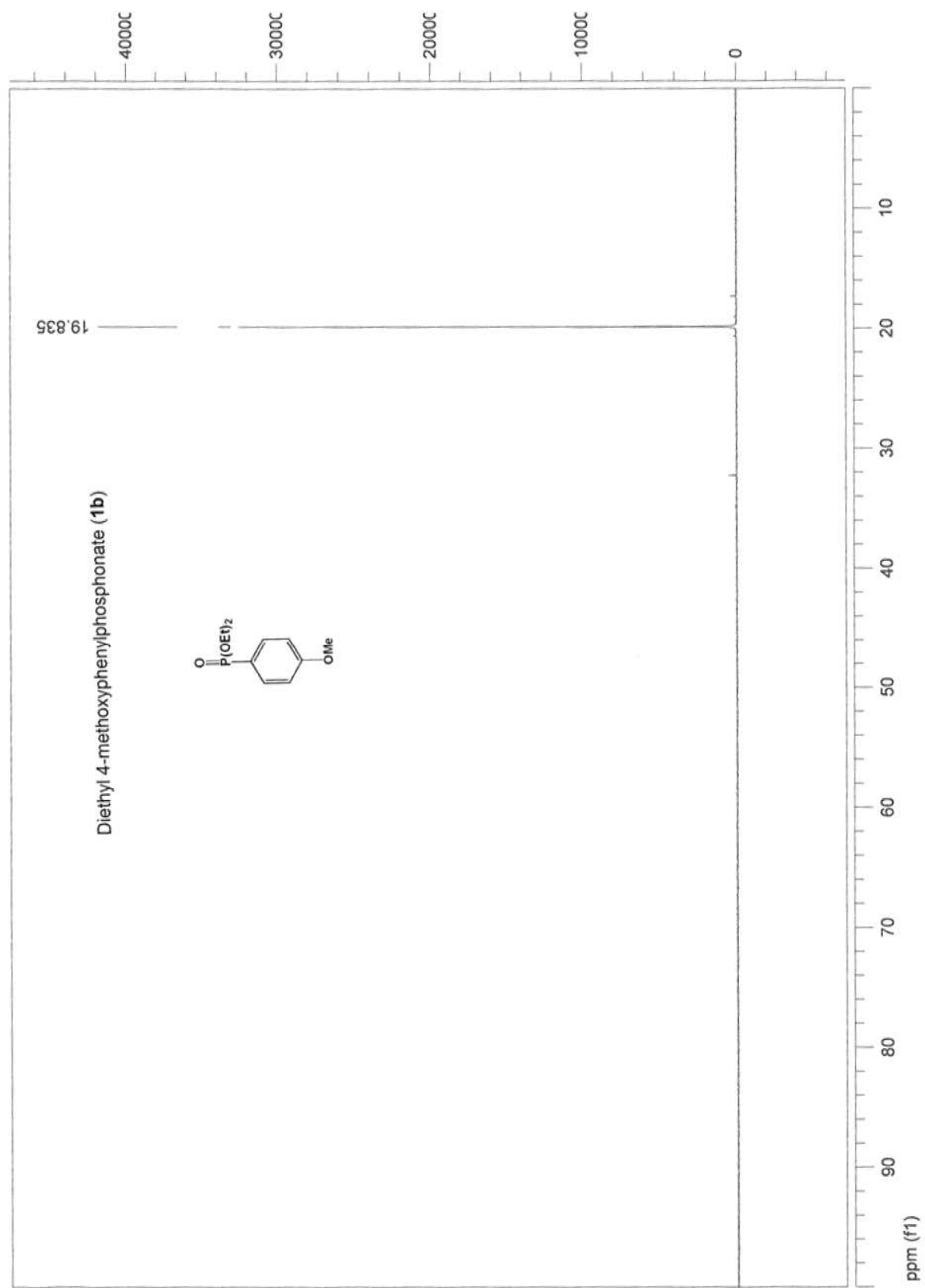
György Keglevich,* Erzsébet Jablonkai and László B. Balázs

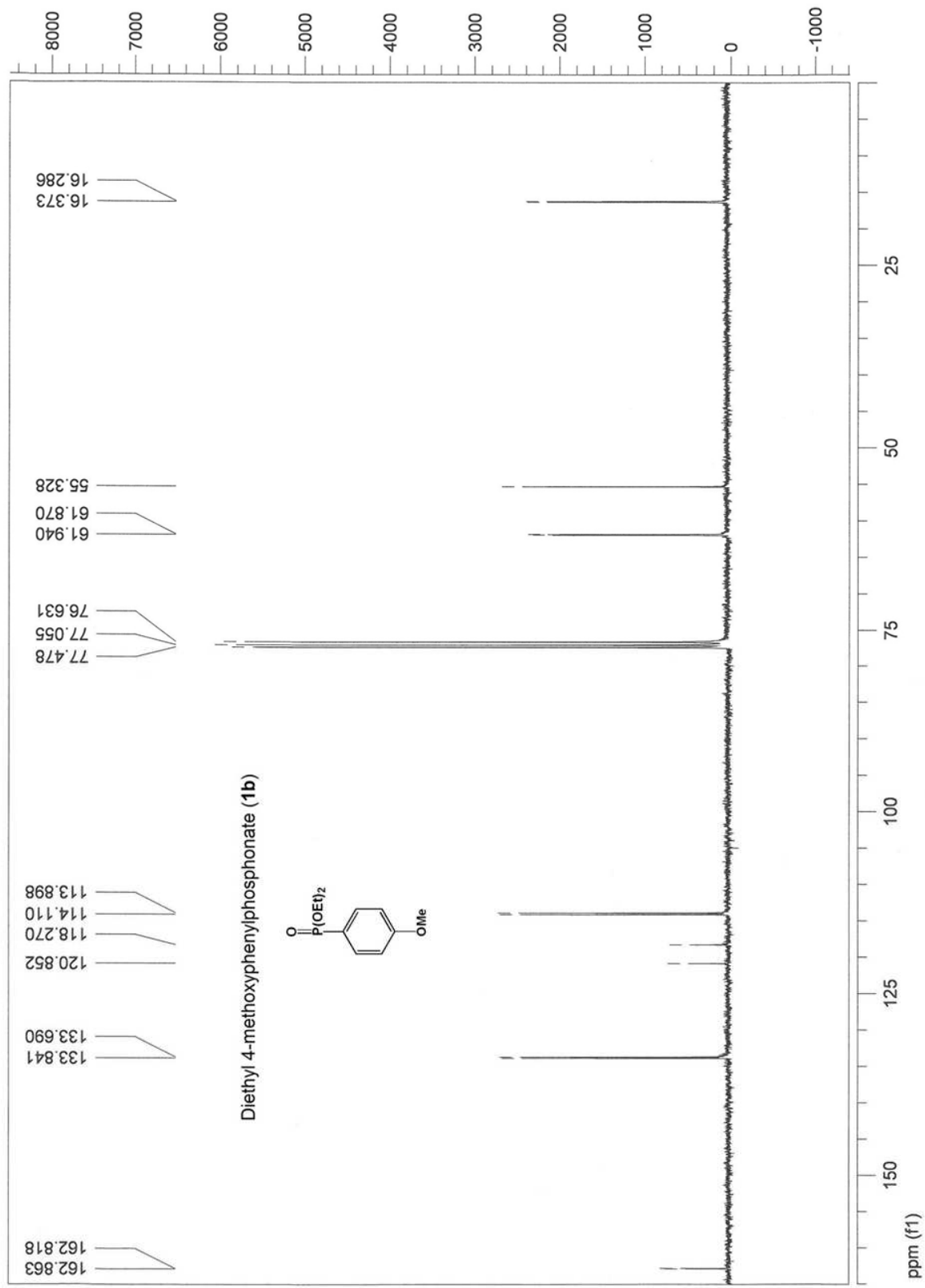
*Department of Organic Chemistry and Technology, Budapest University of Technology and Economics,
1521 Budapest, Hungary, E-mail: gkeglevich@mail.bme.hu*

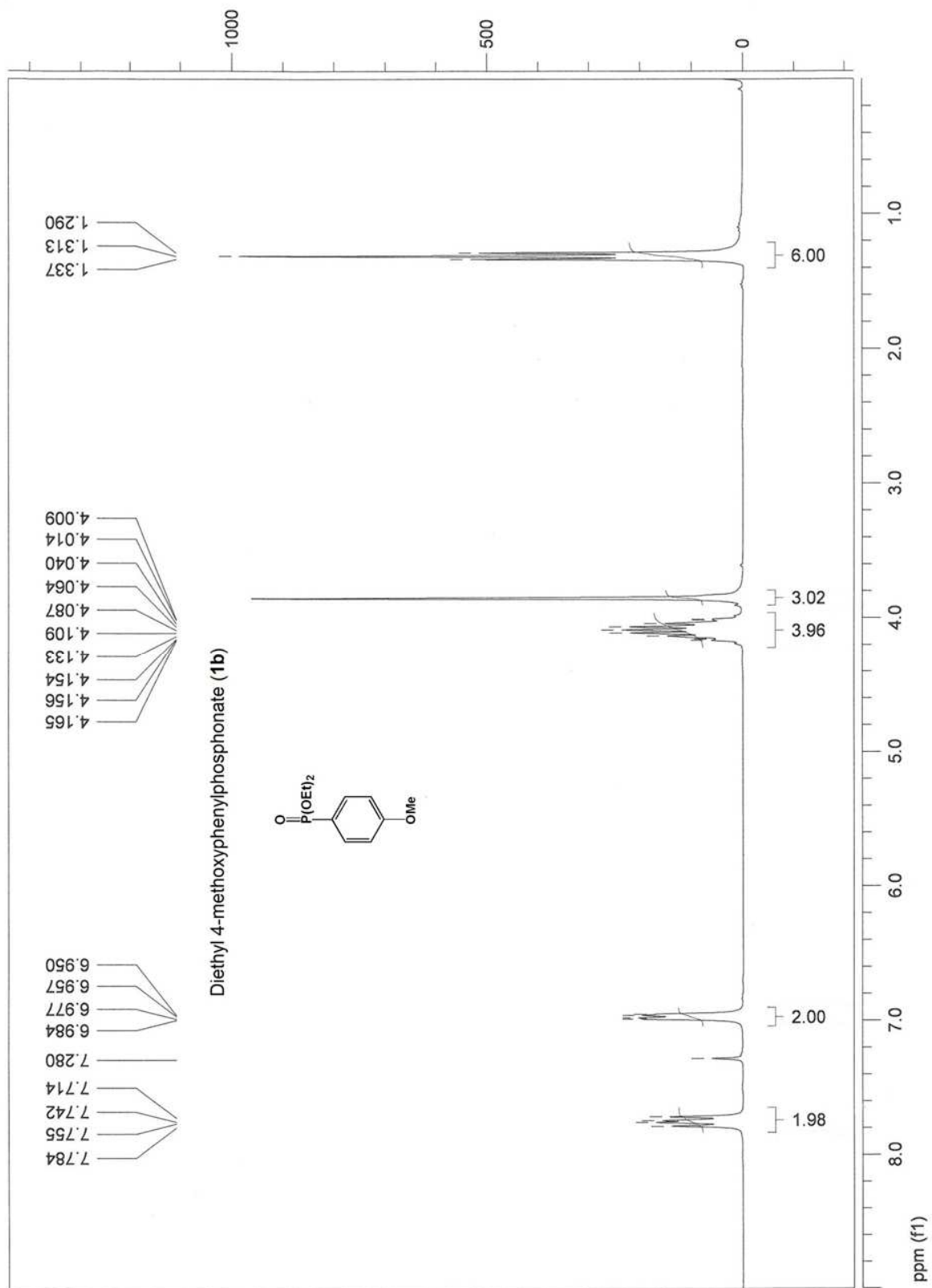


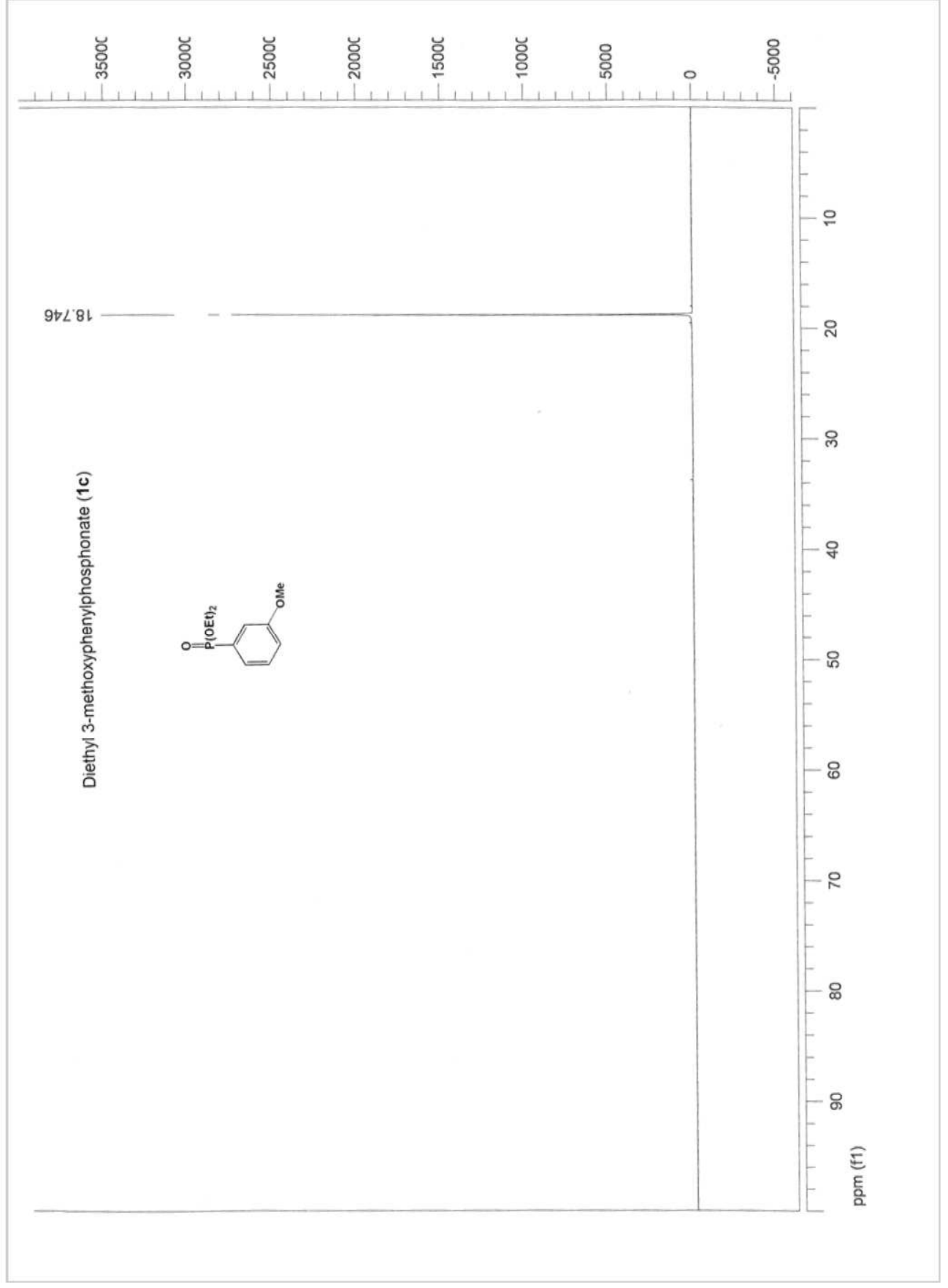


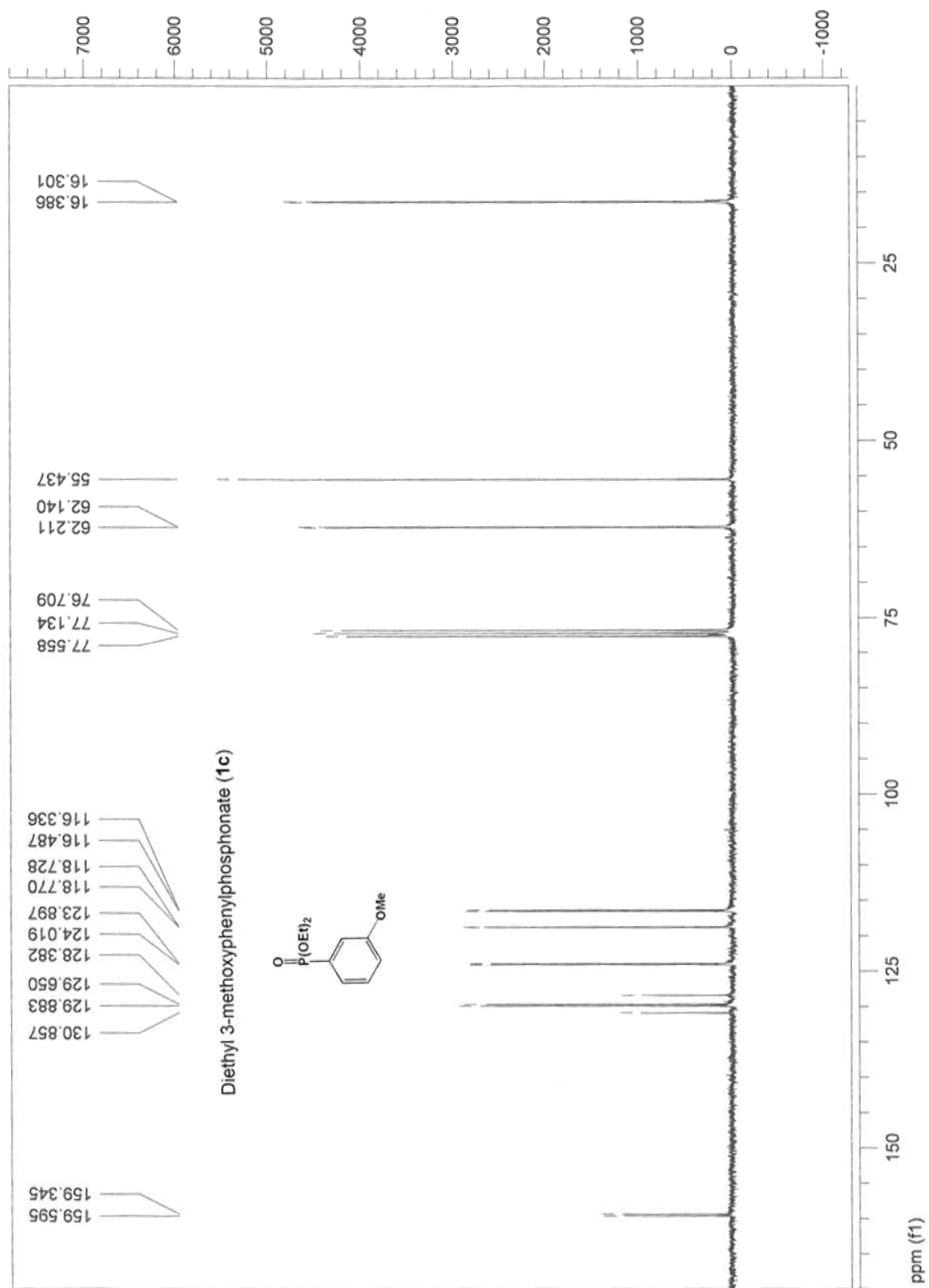


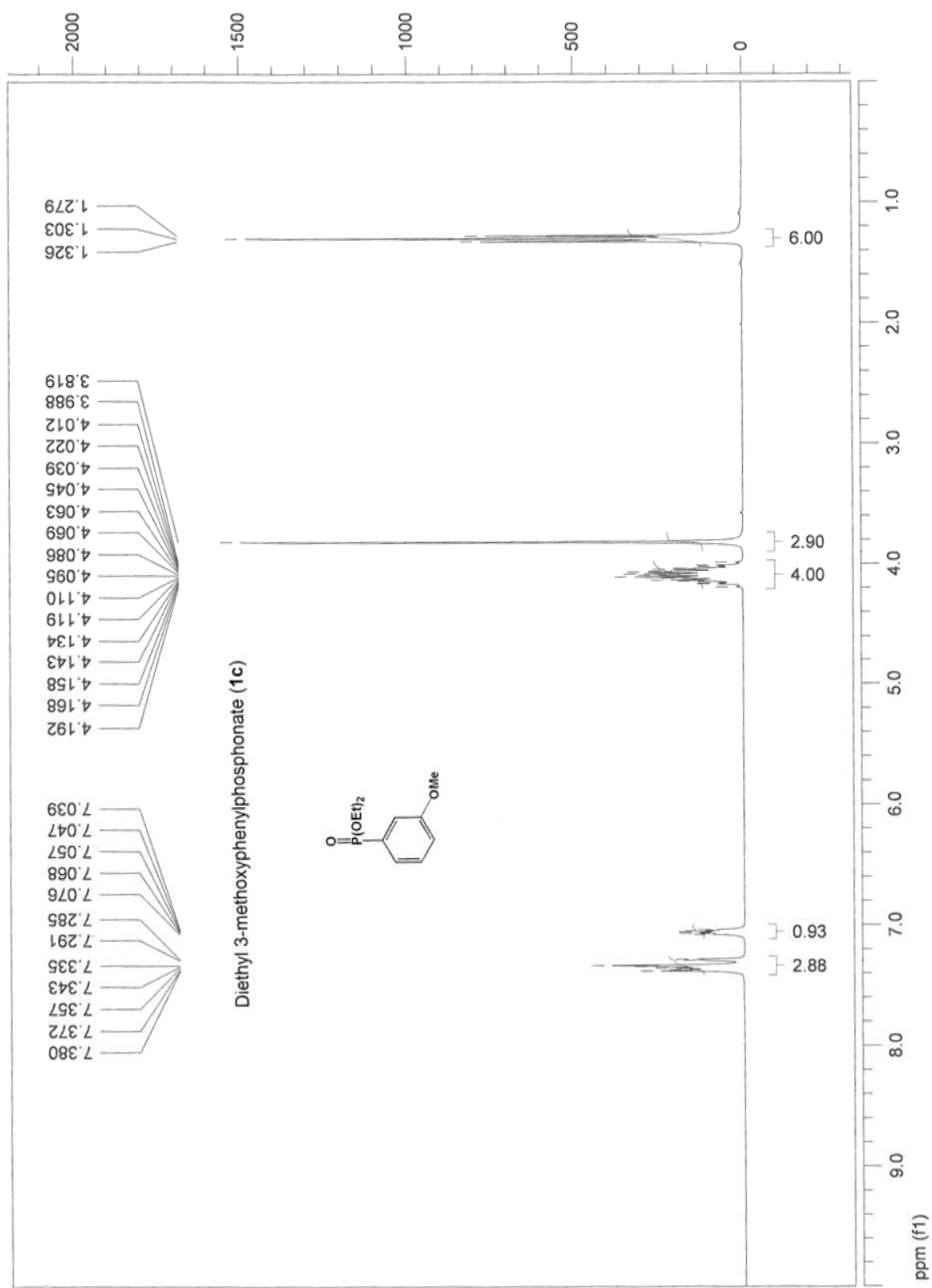




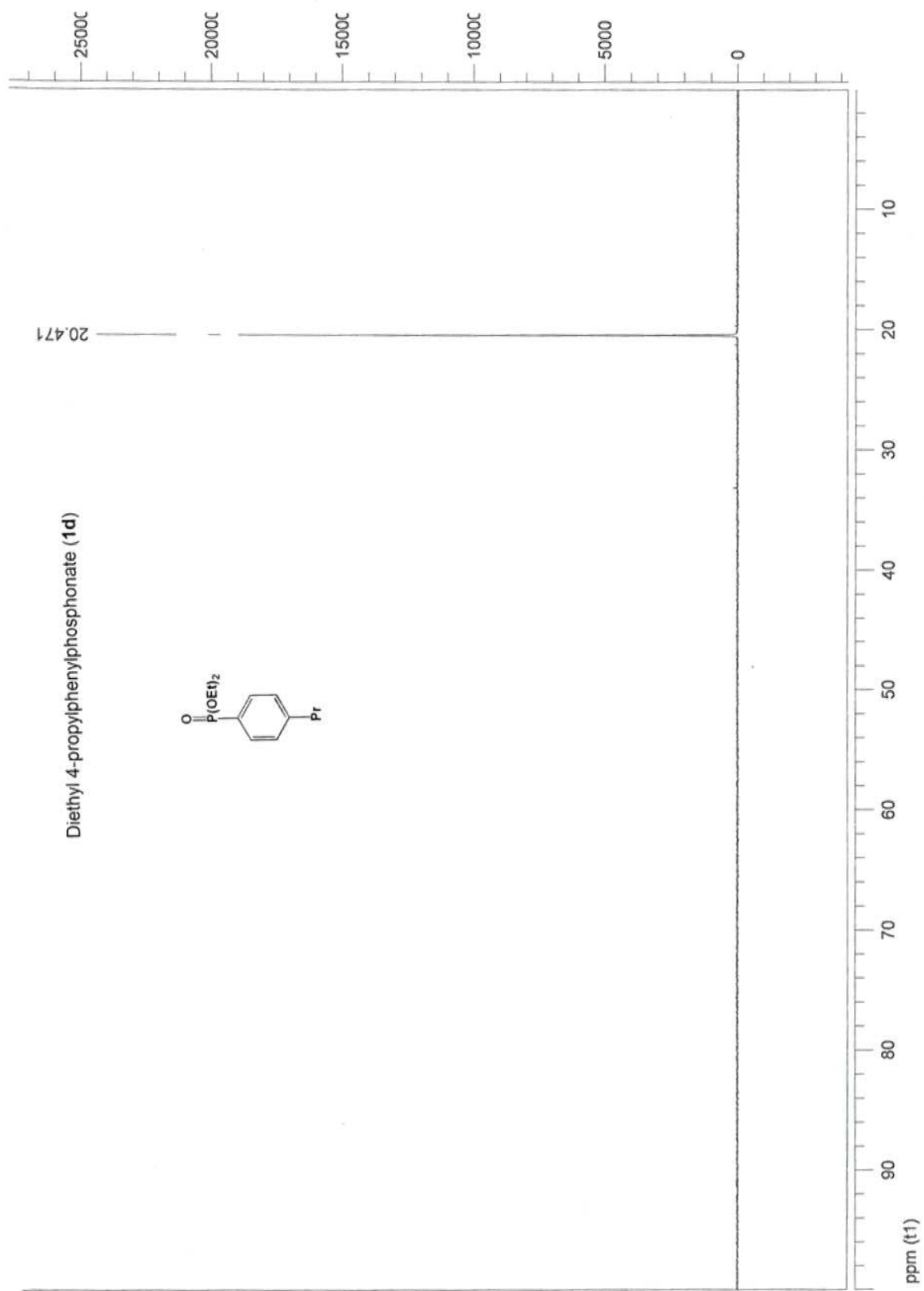
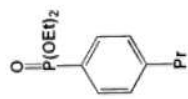


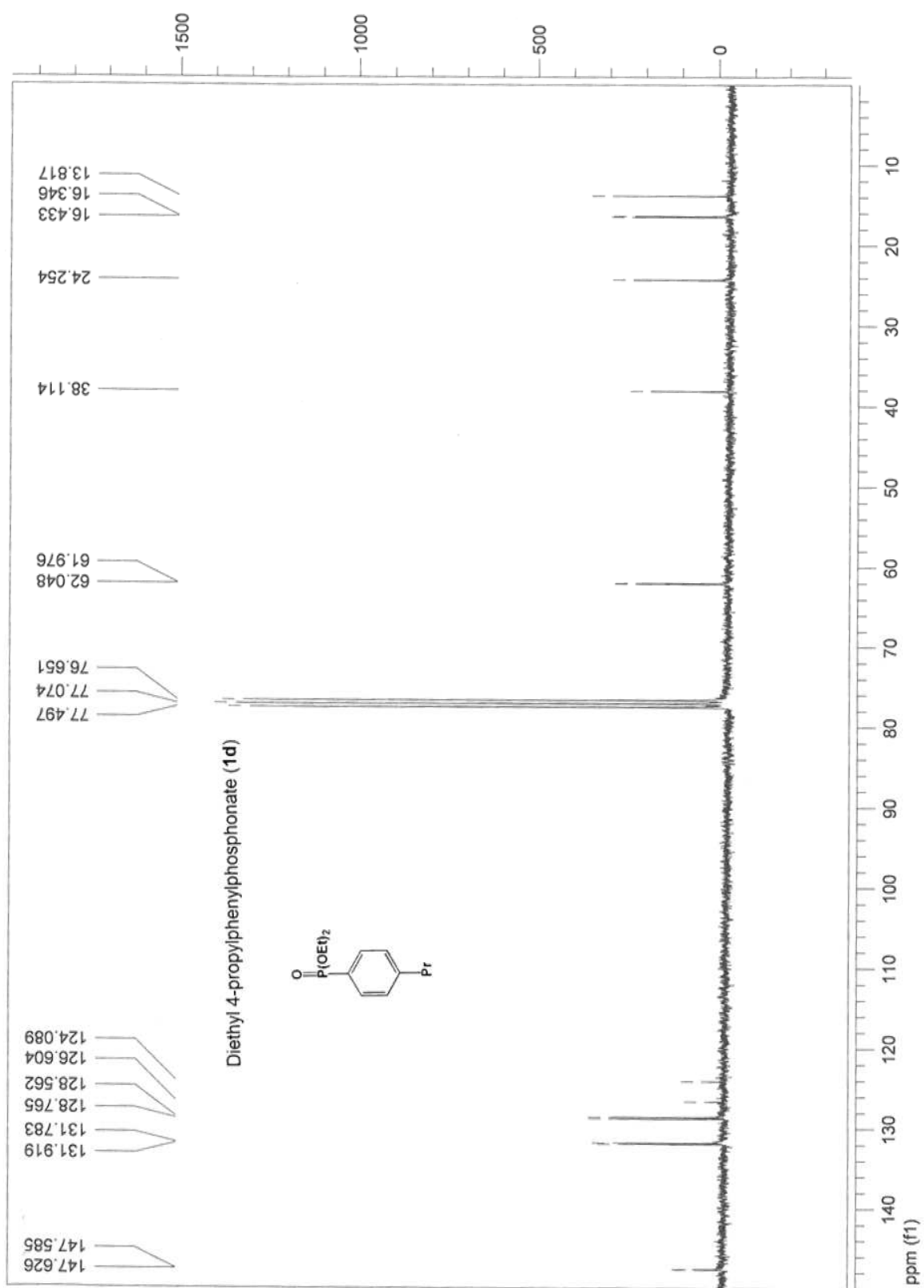


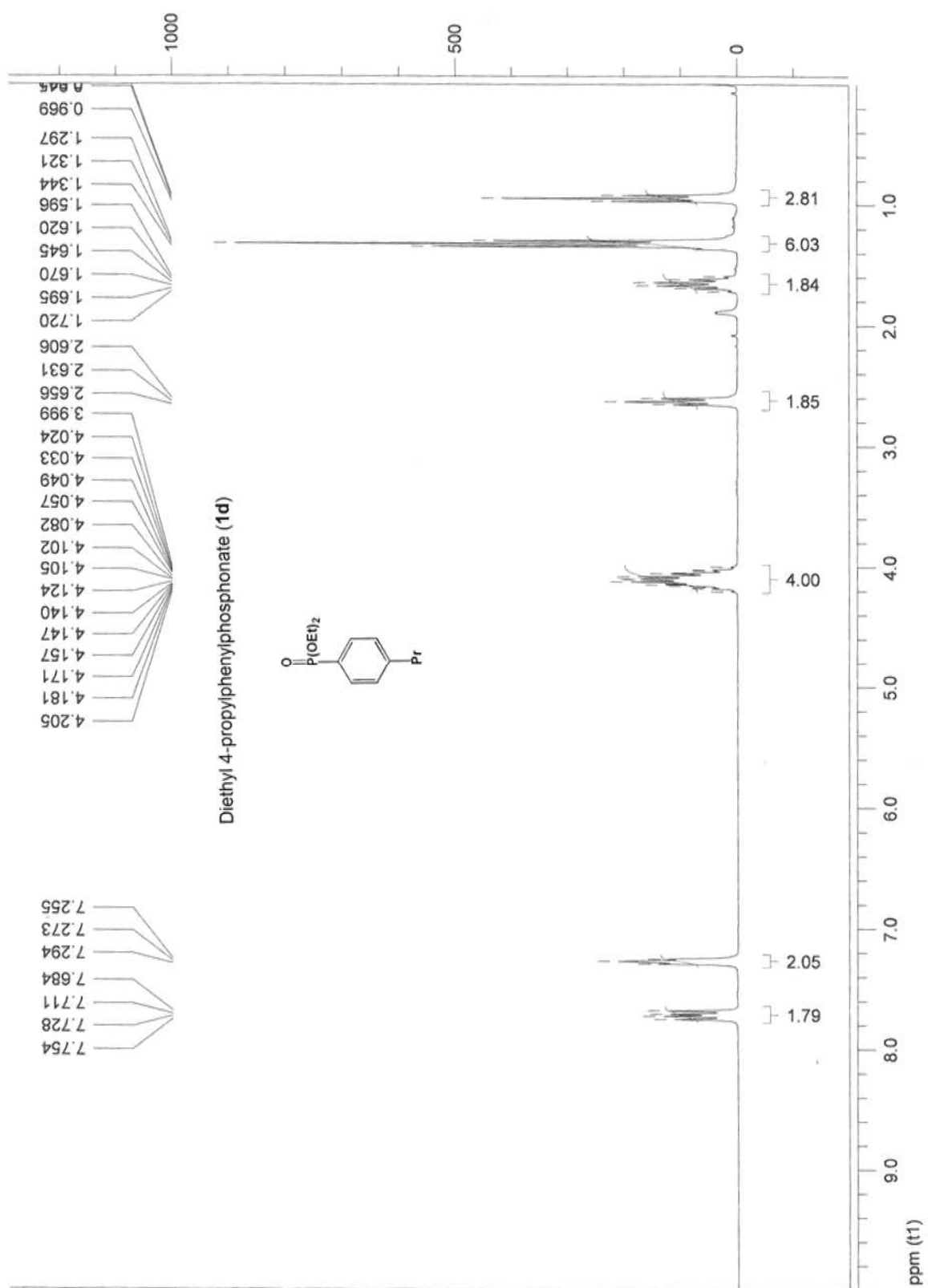




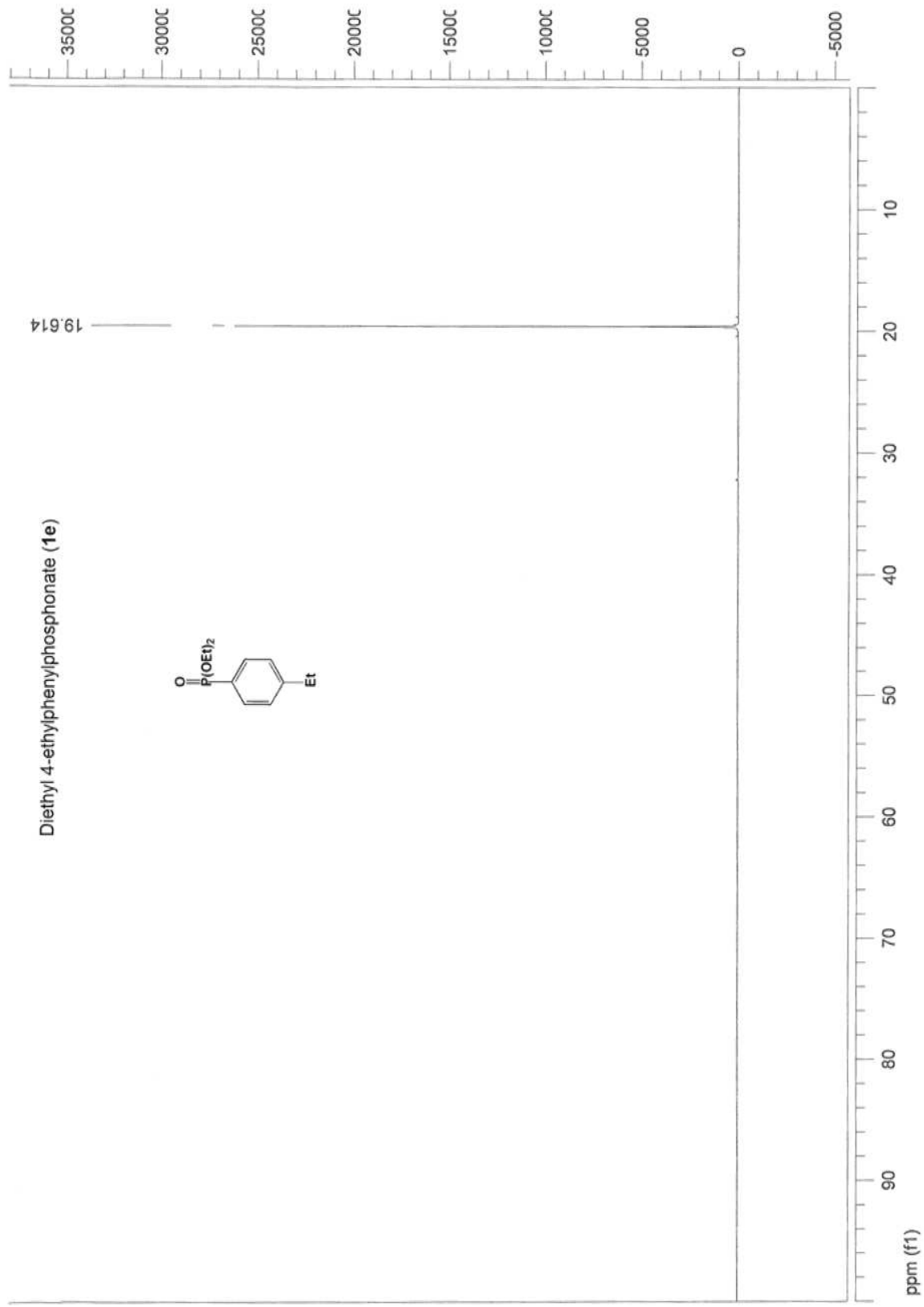
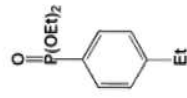
Diethyl 4-propylphenylphosphonate (**1d**)

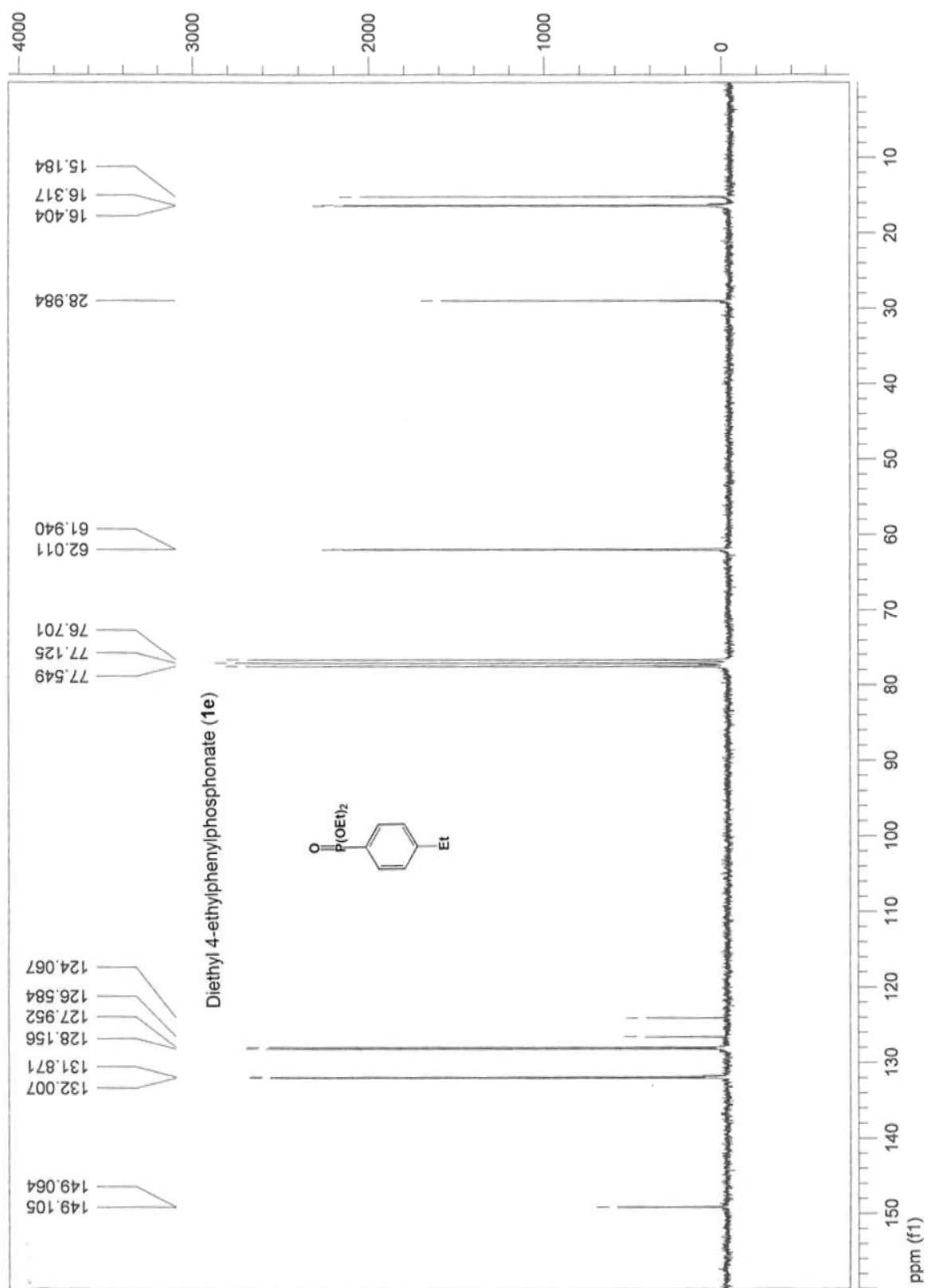


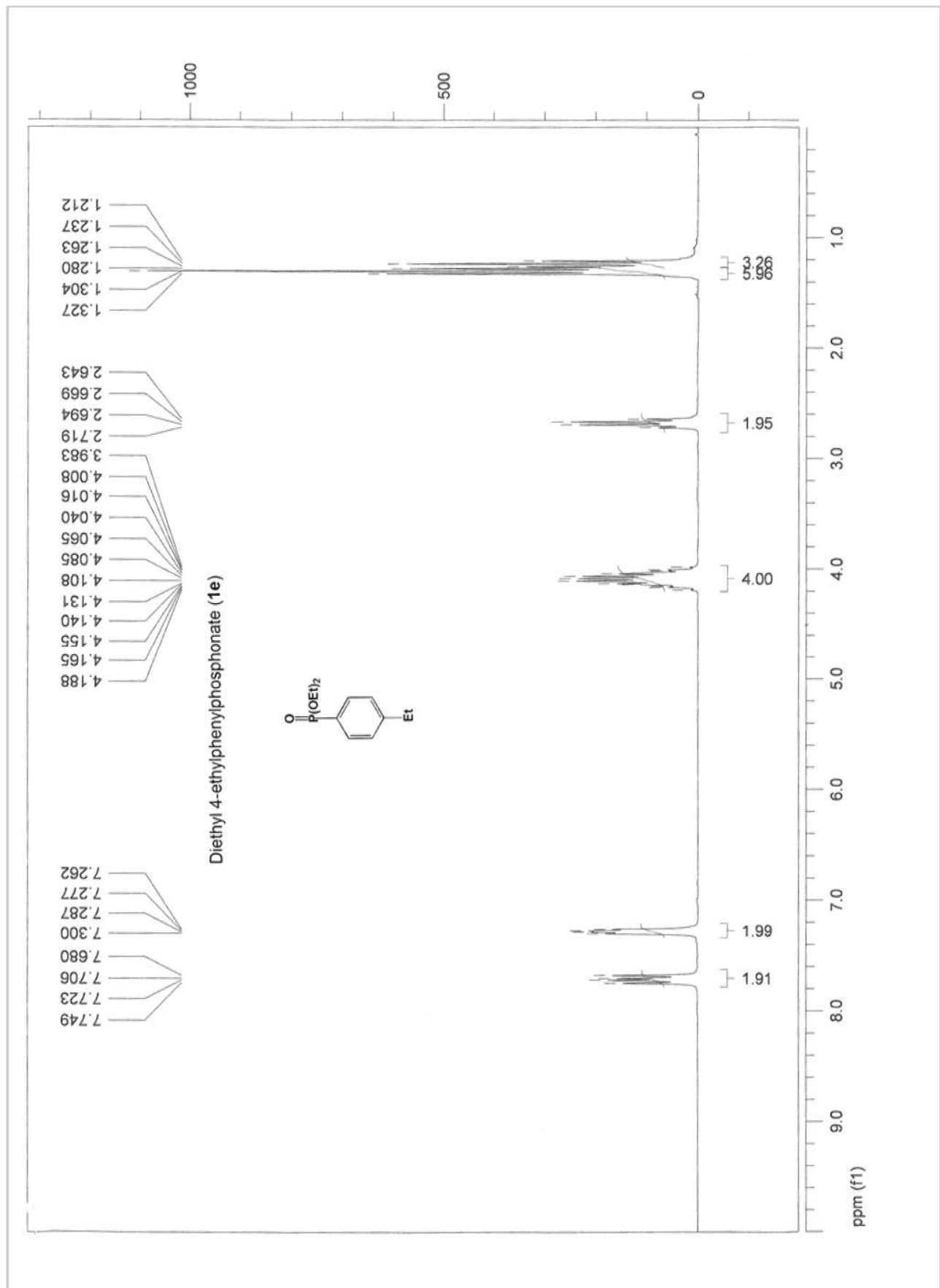




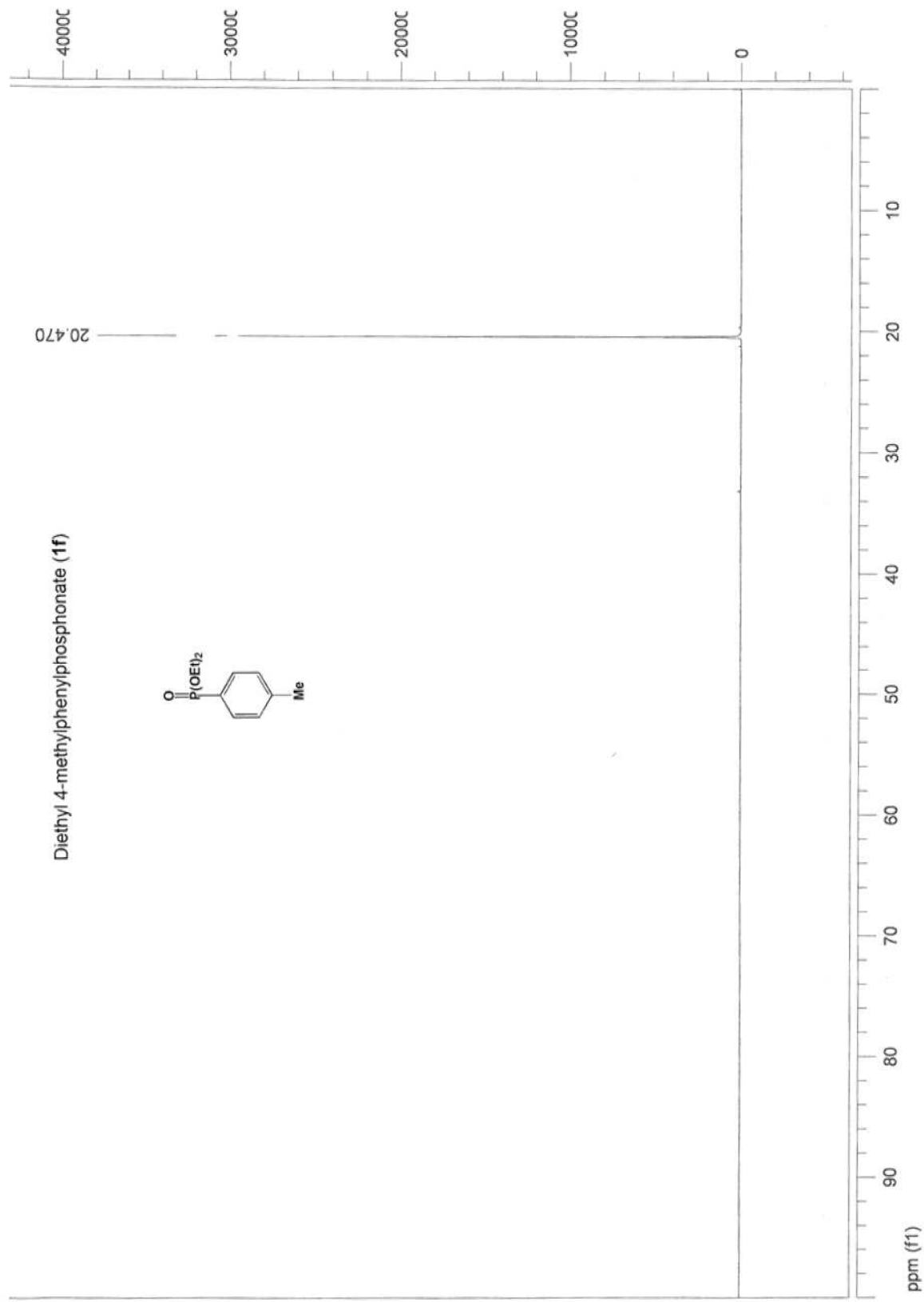
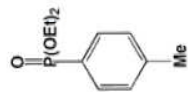
Diethyl 4-ethylphenylphosphonate (**1e**)

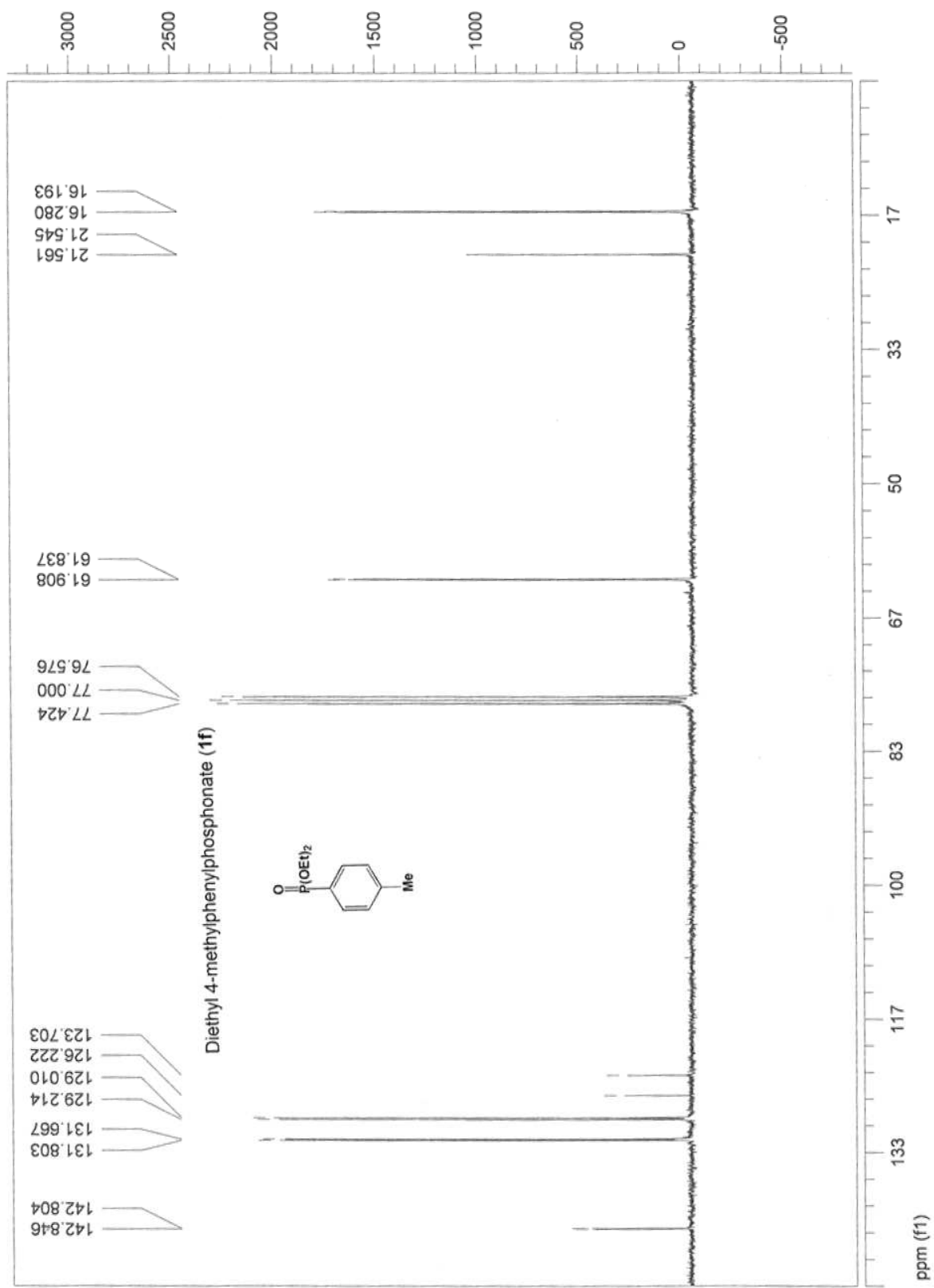


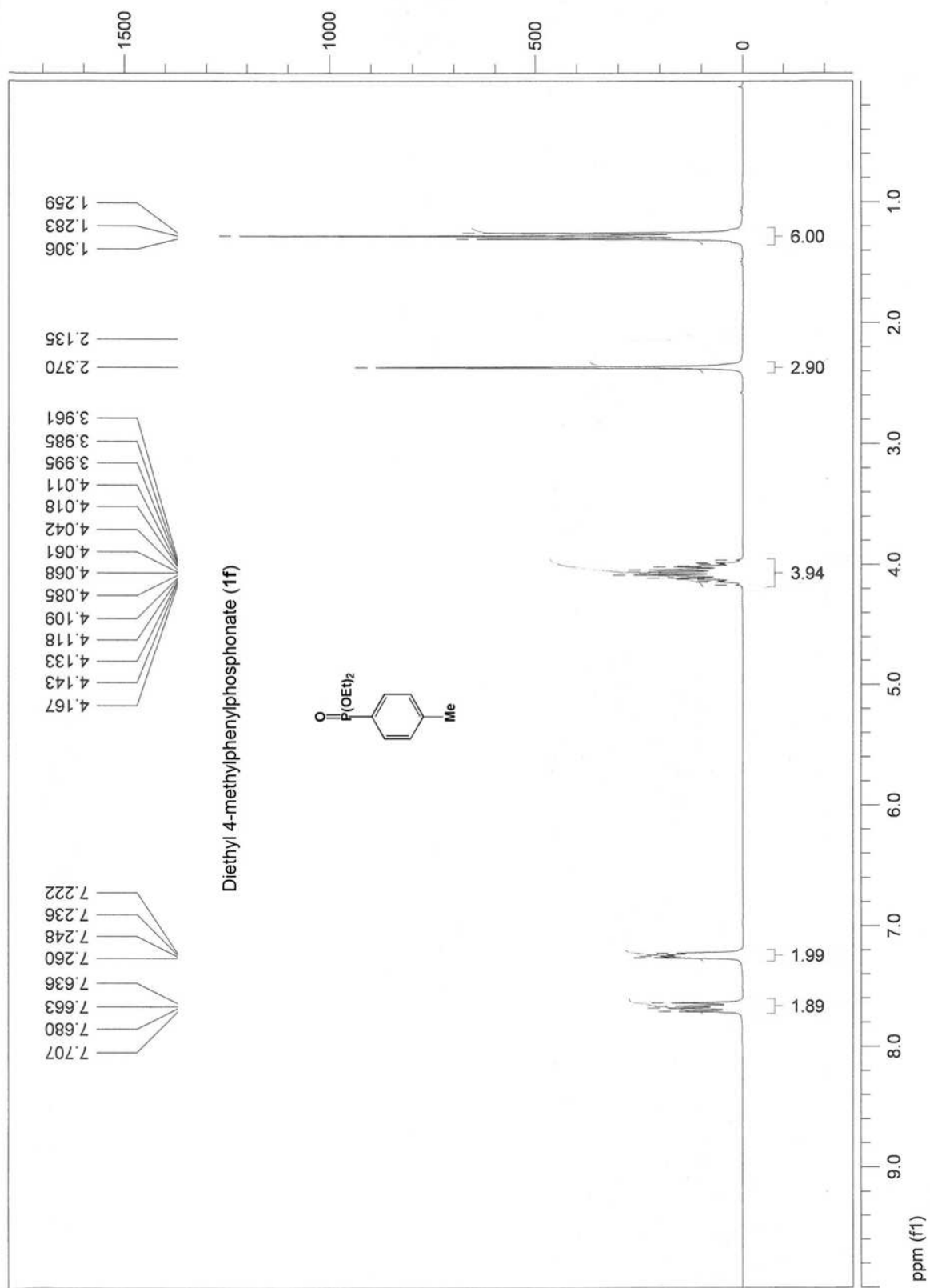




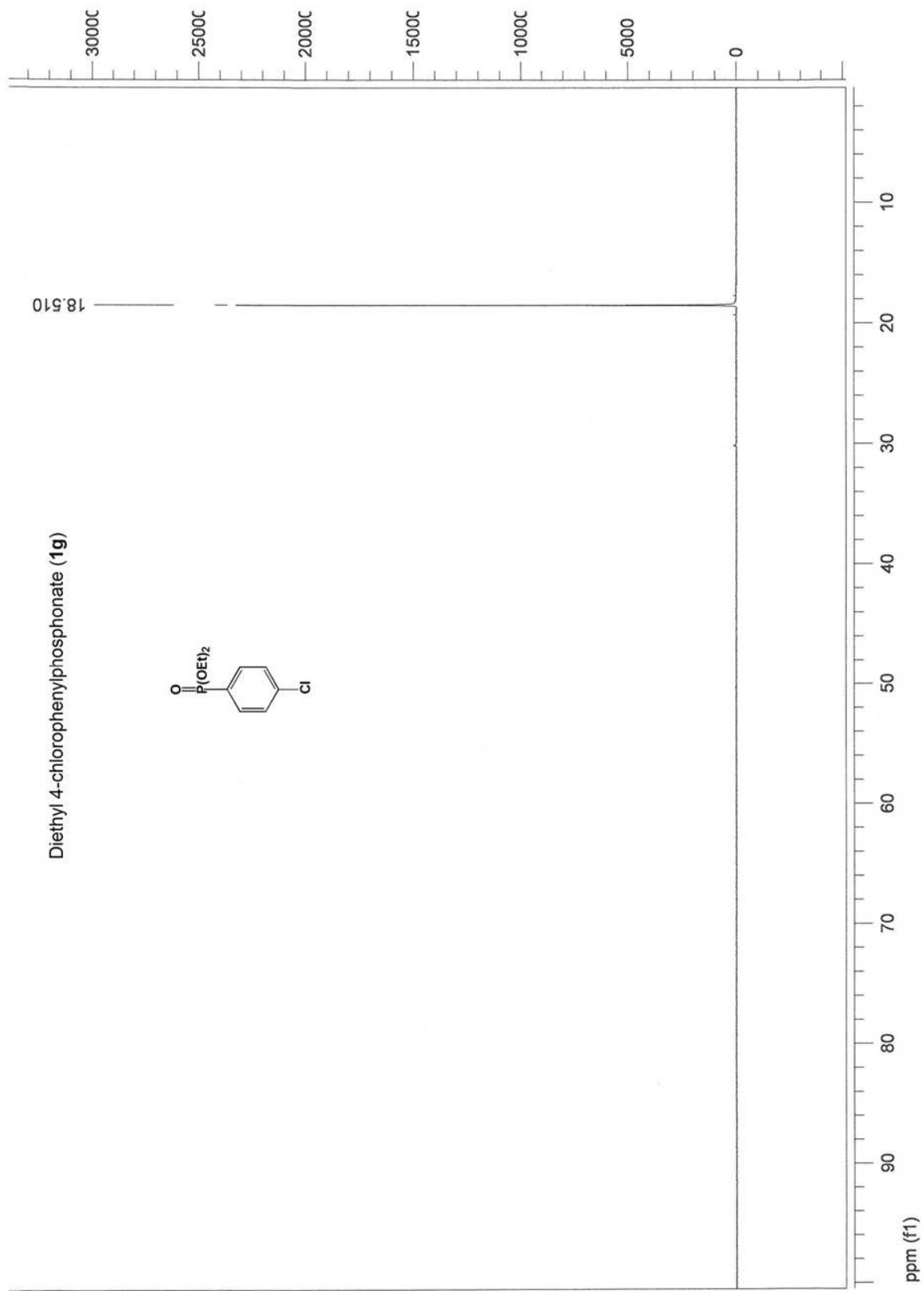
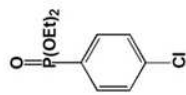
Diethyl 4-methylphenylphosphonate (**1f**)

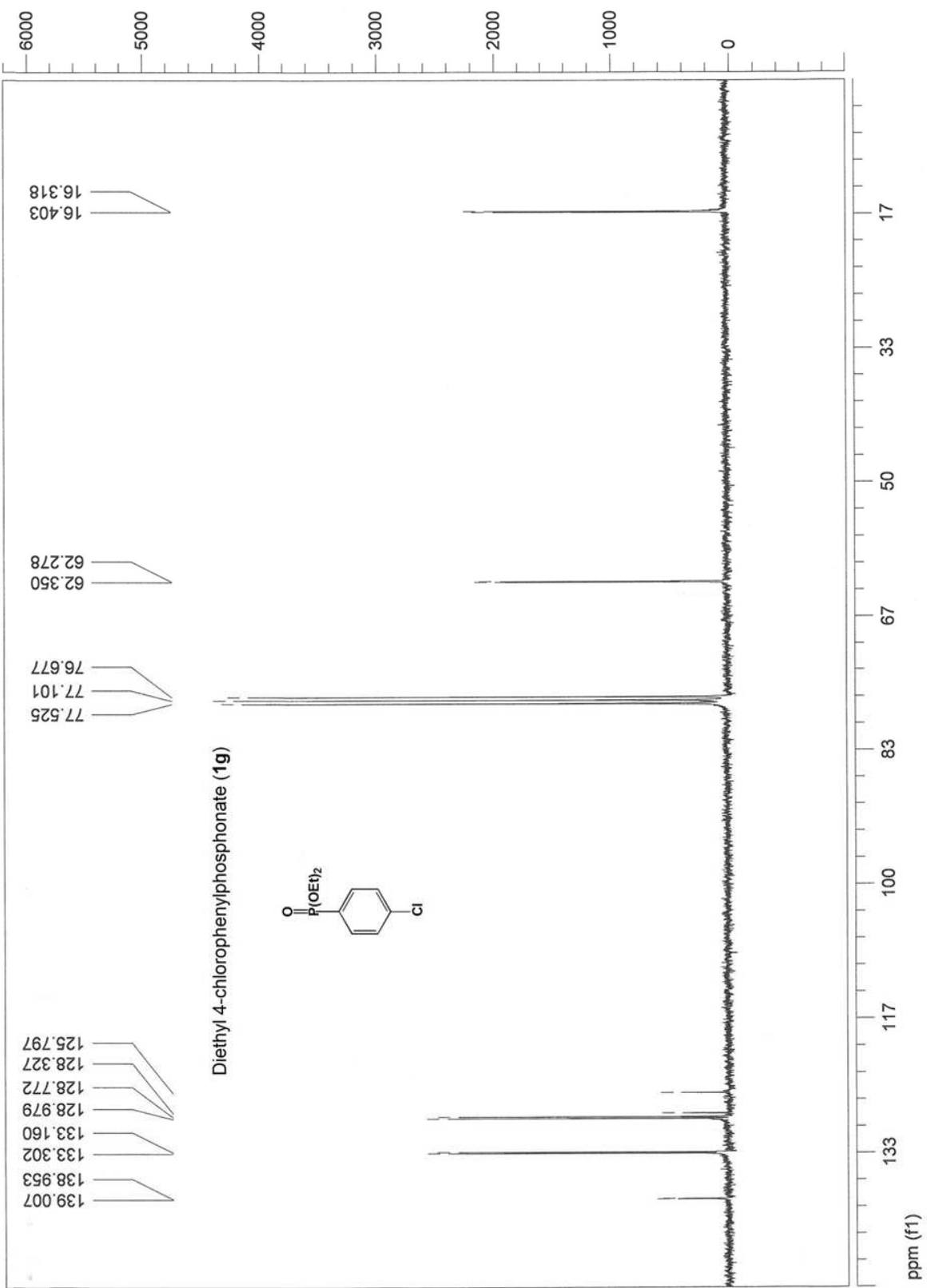


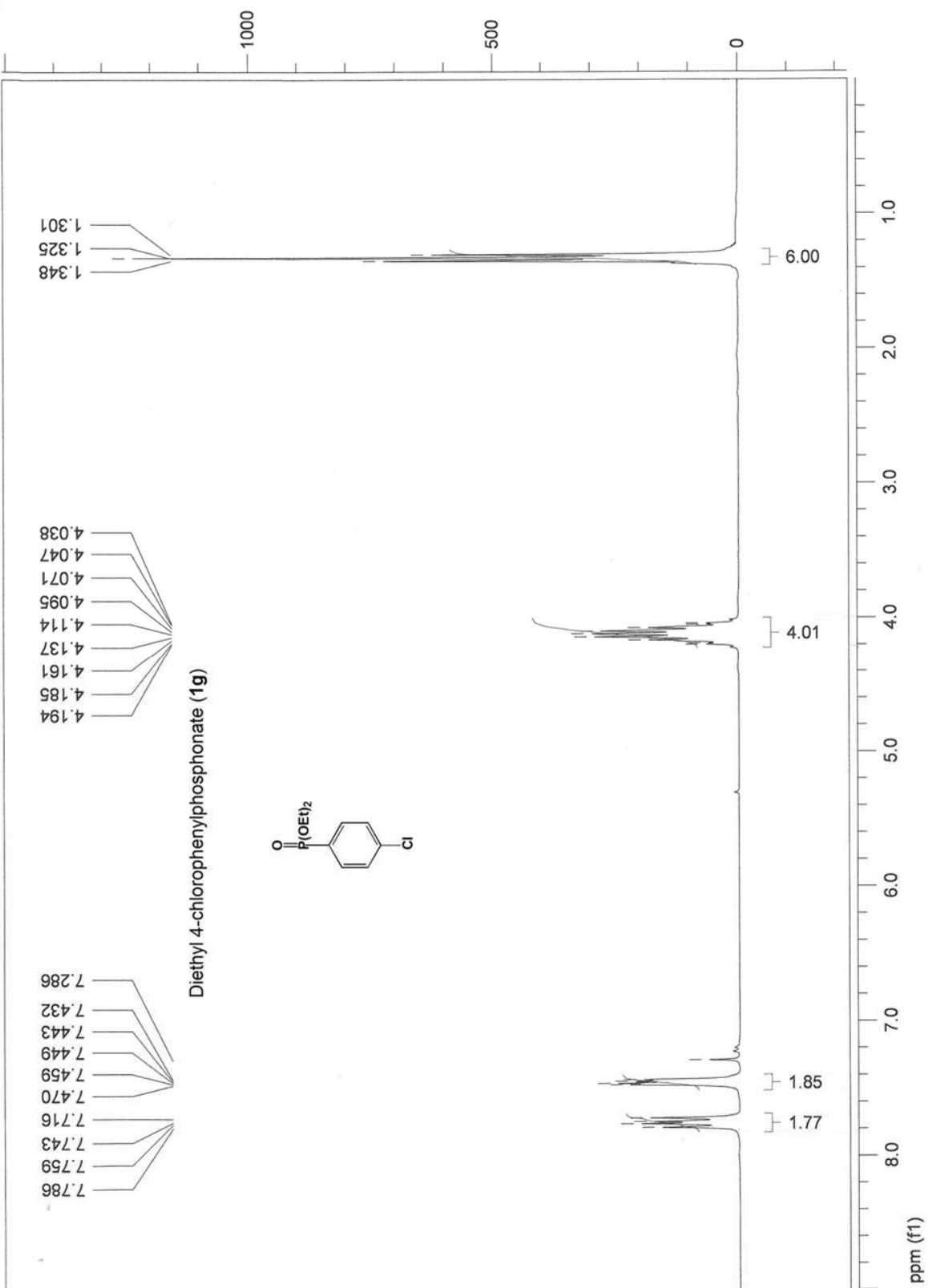




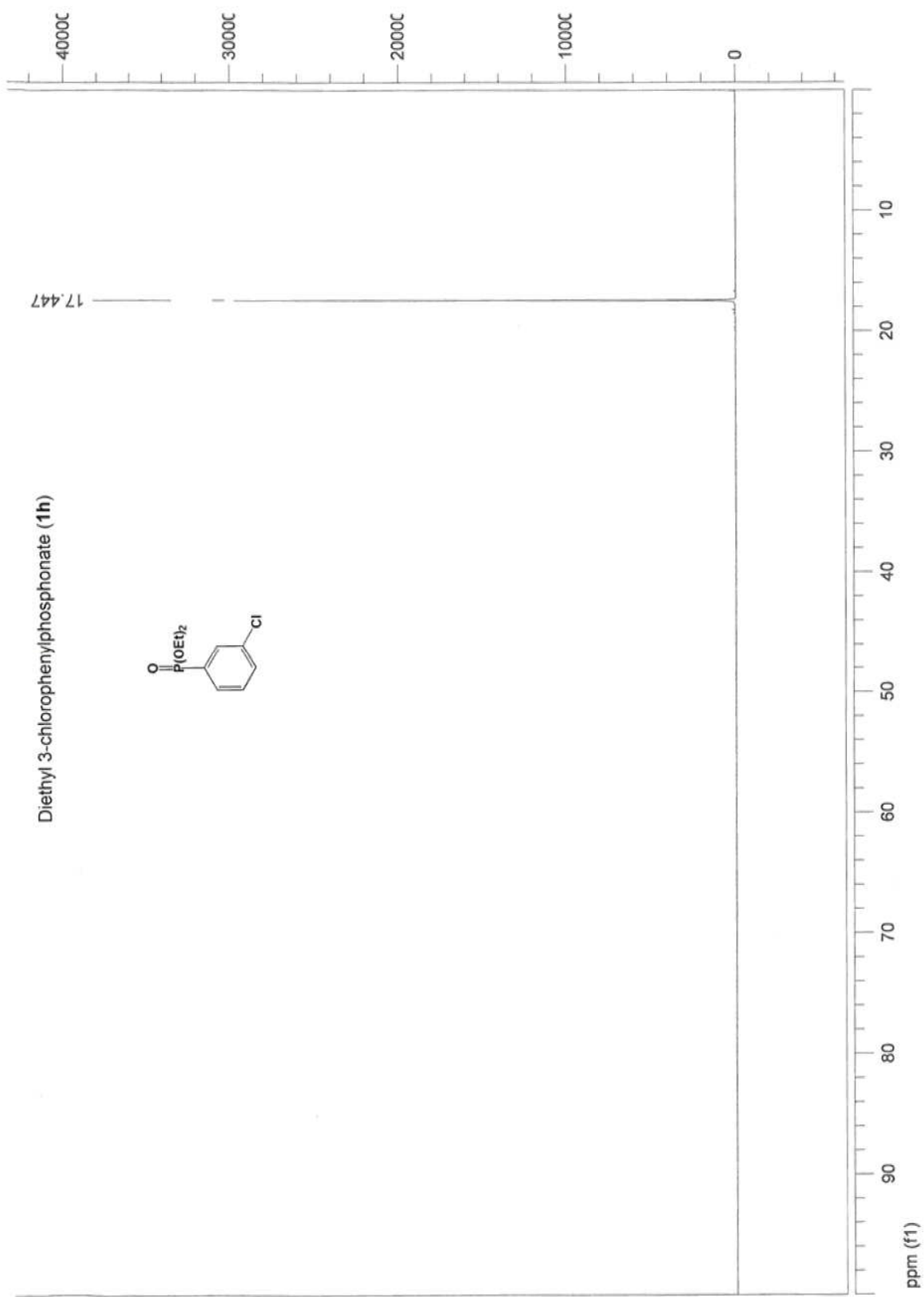
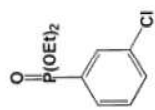
Diethyl 4-chlorophenylphosphonate (**1g**)

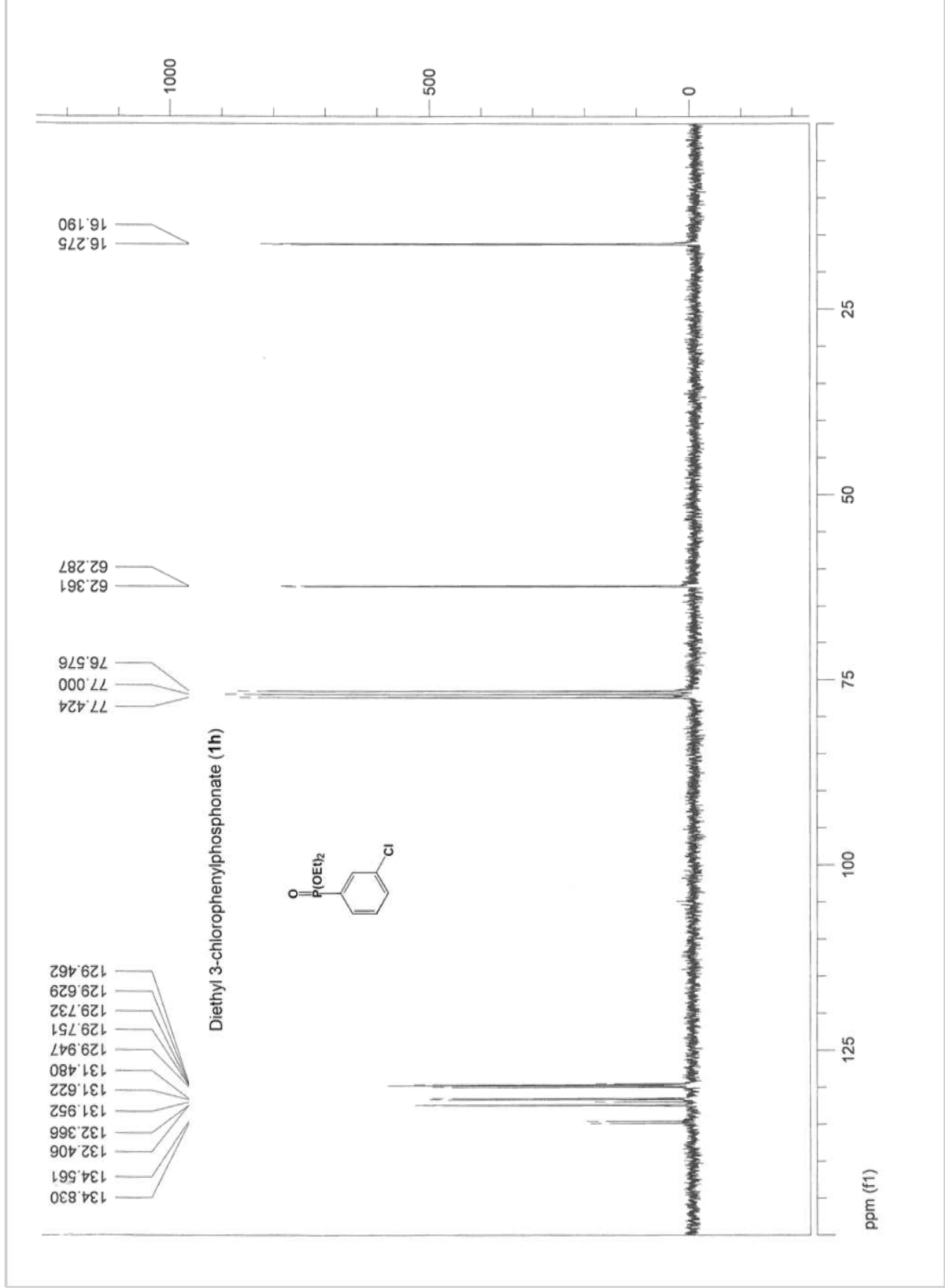


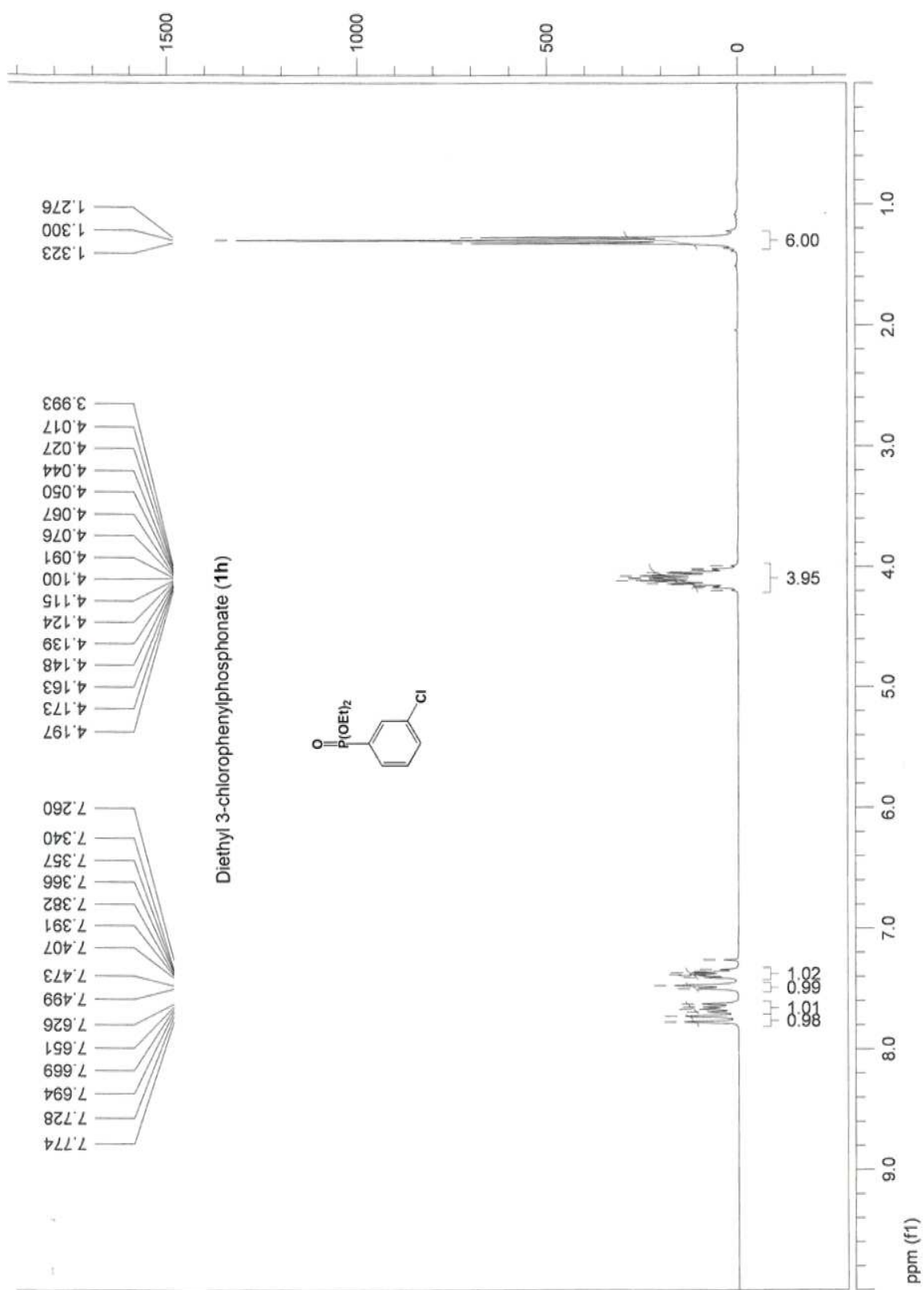




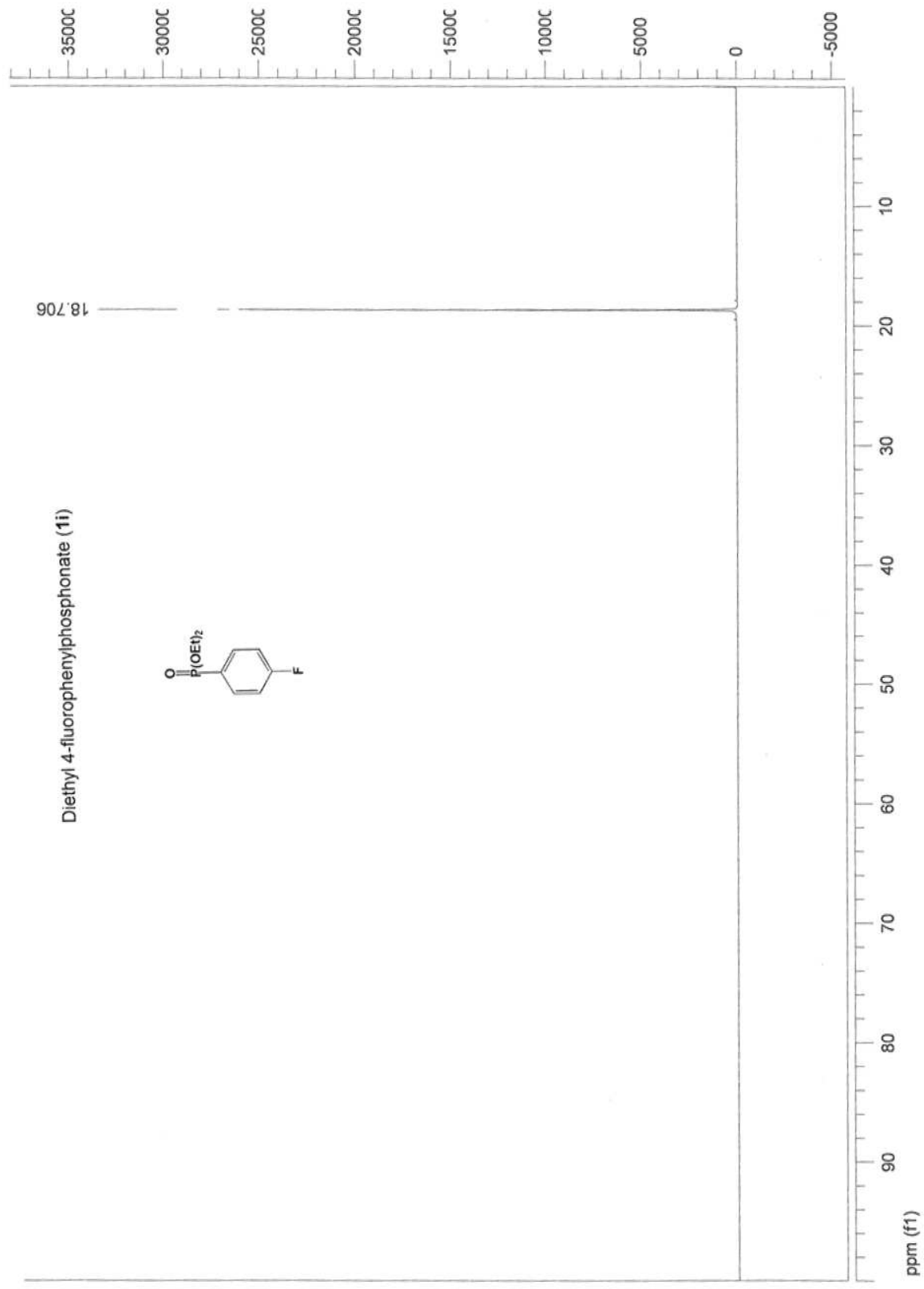
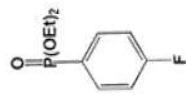
Diethyl 3-chlorophenylphosphonate (**1h**)

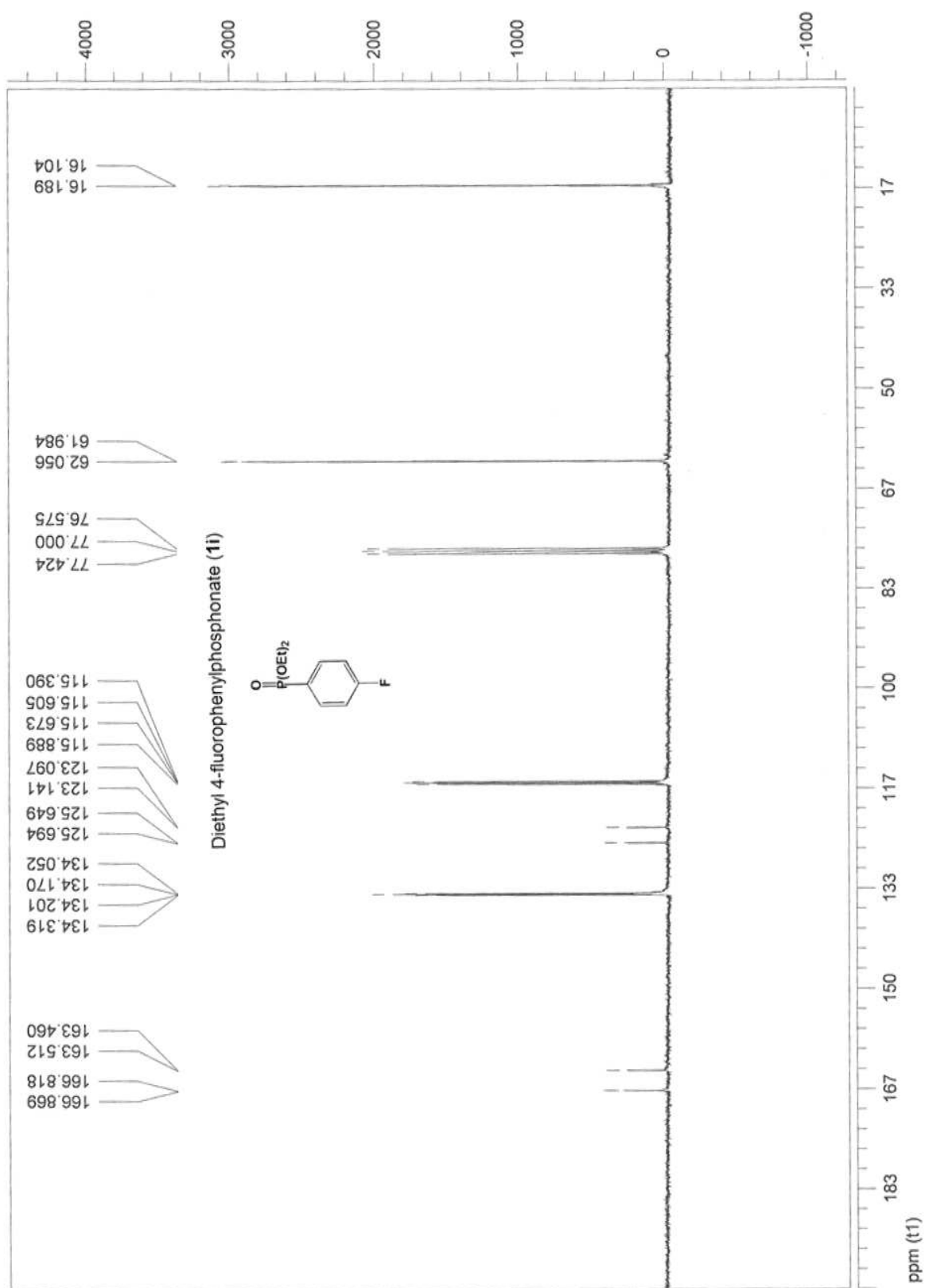


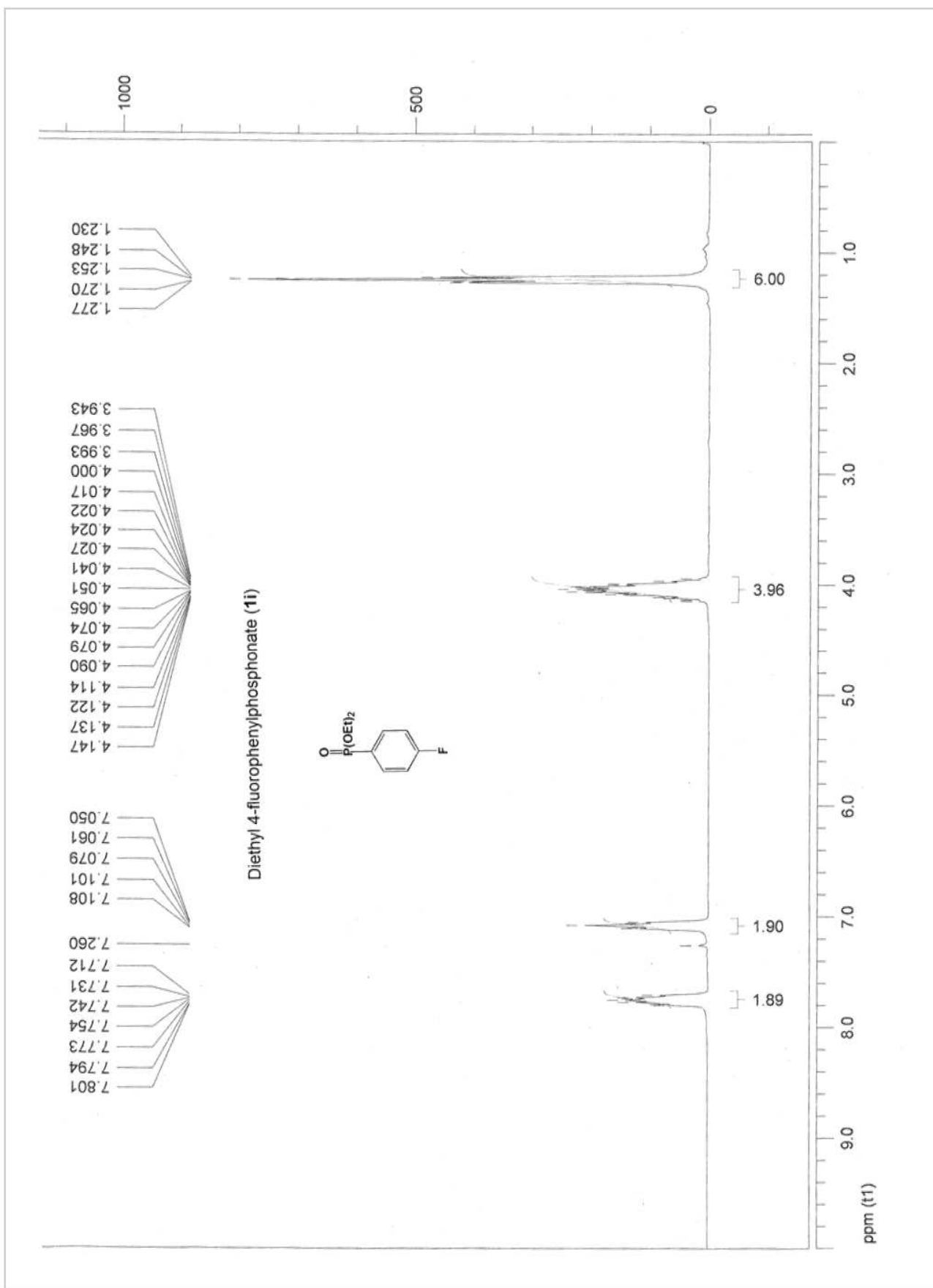




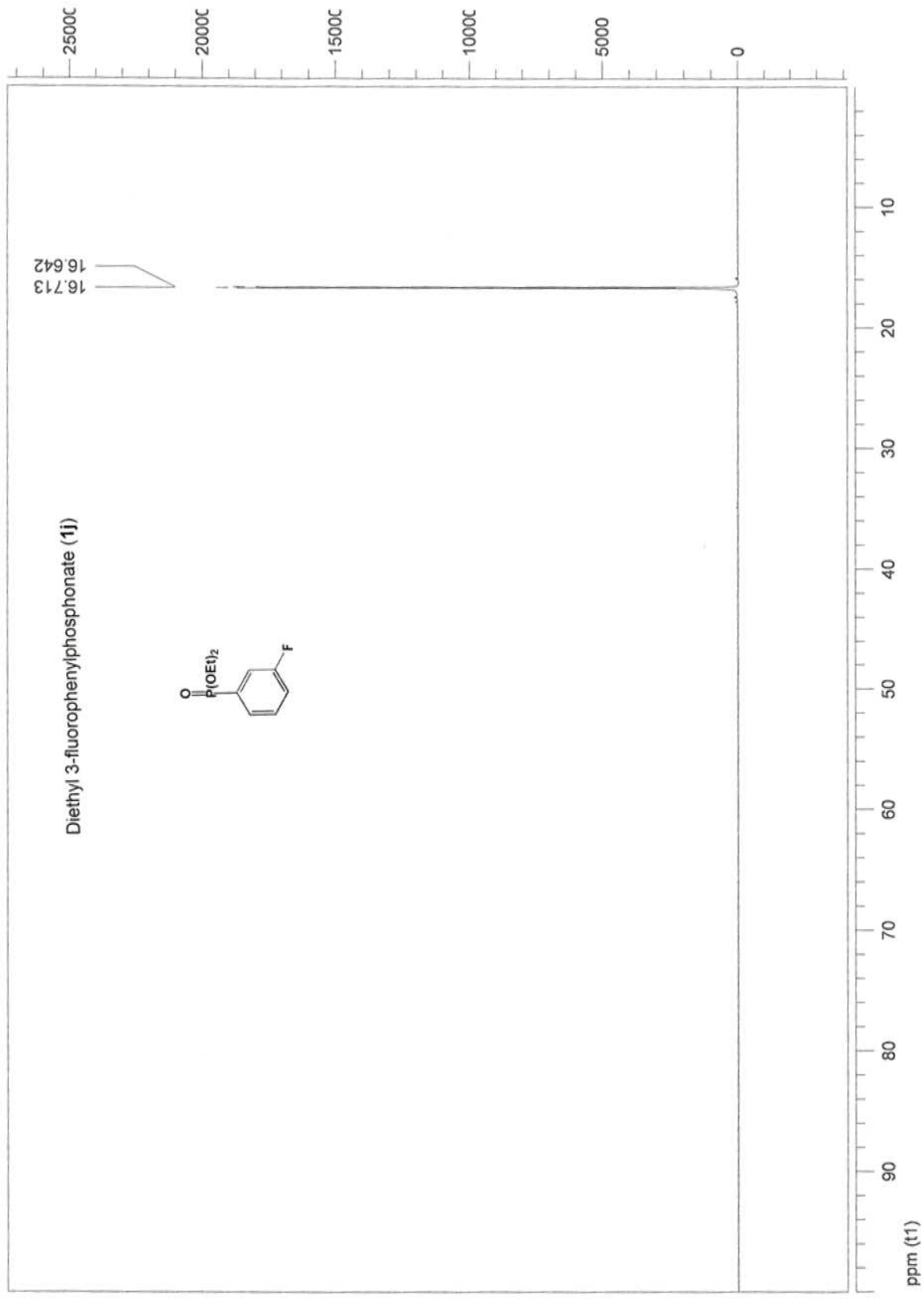
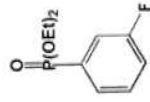
Diethyl 4-fluorophenylphosphonate (**1i**)

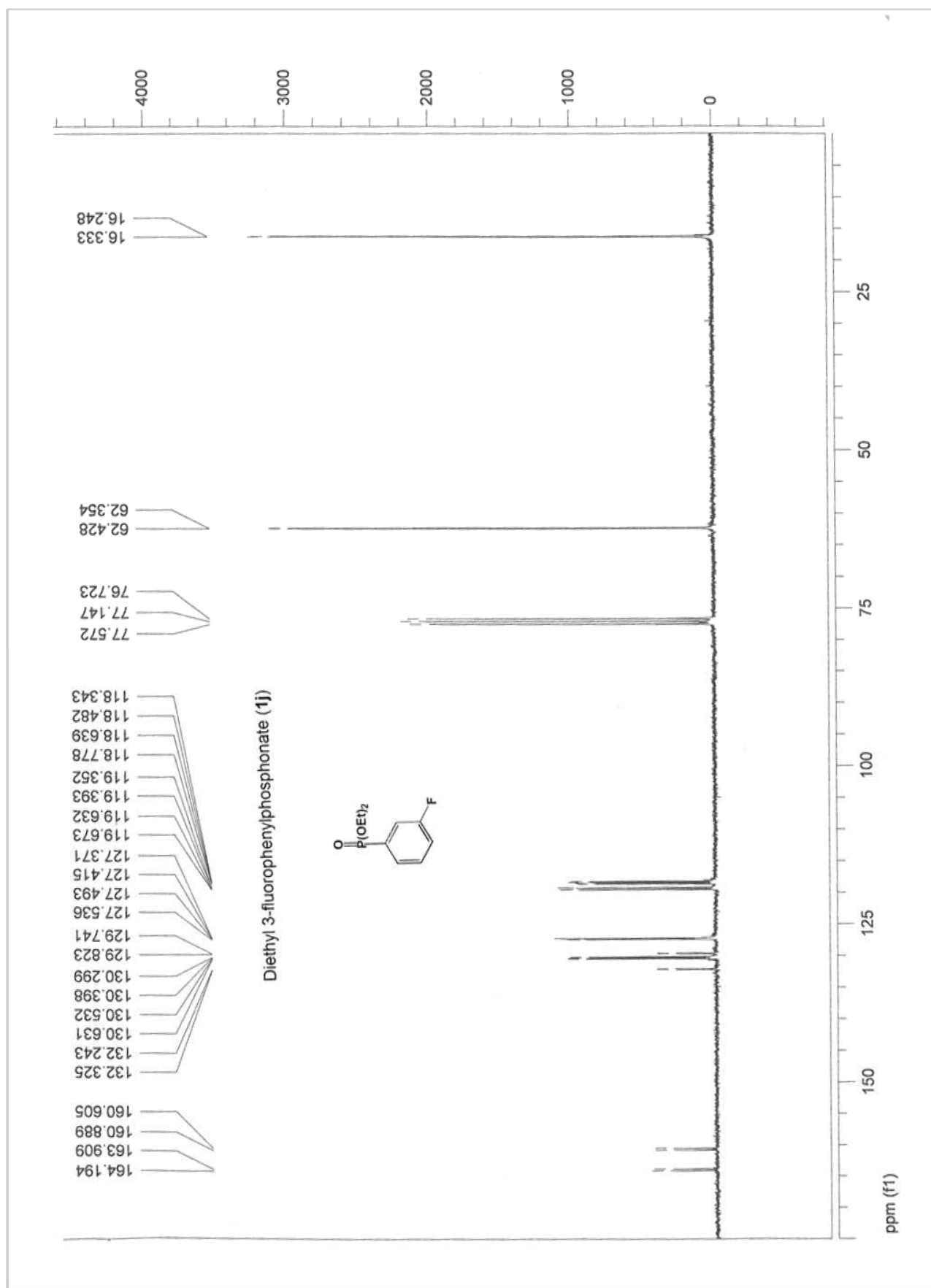


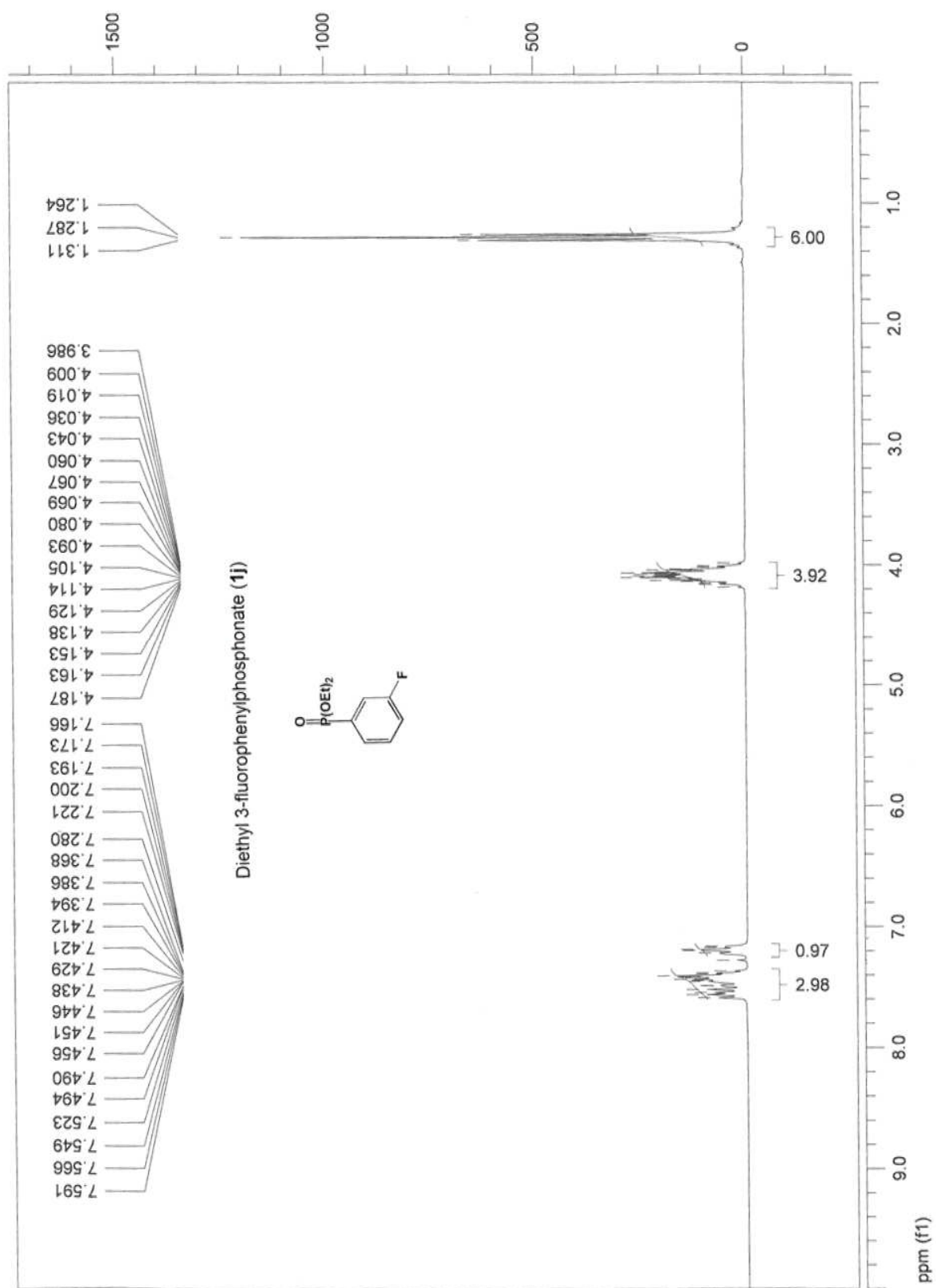


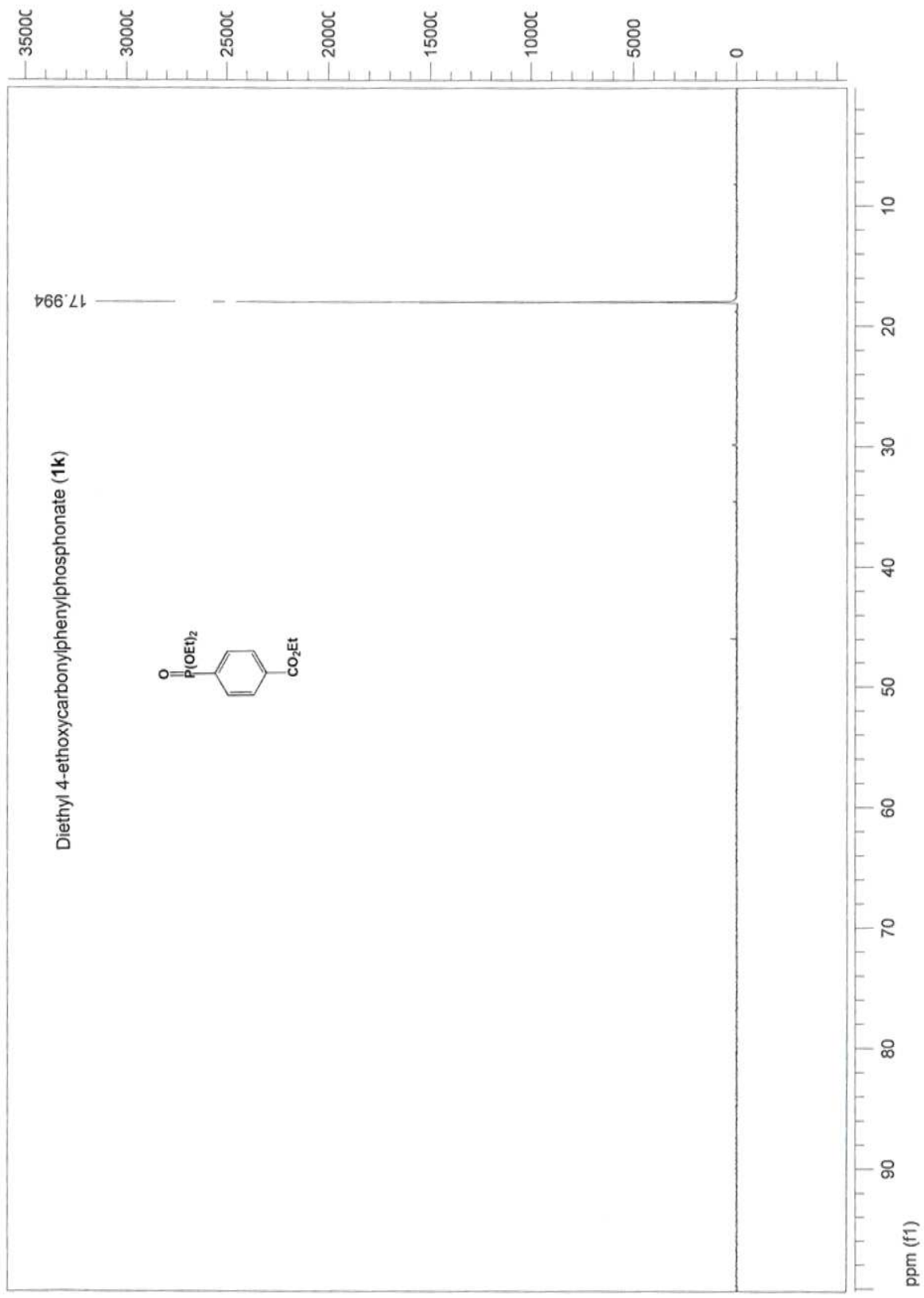


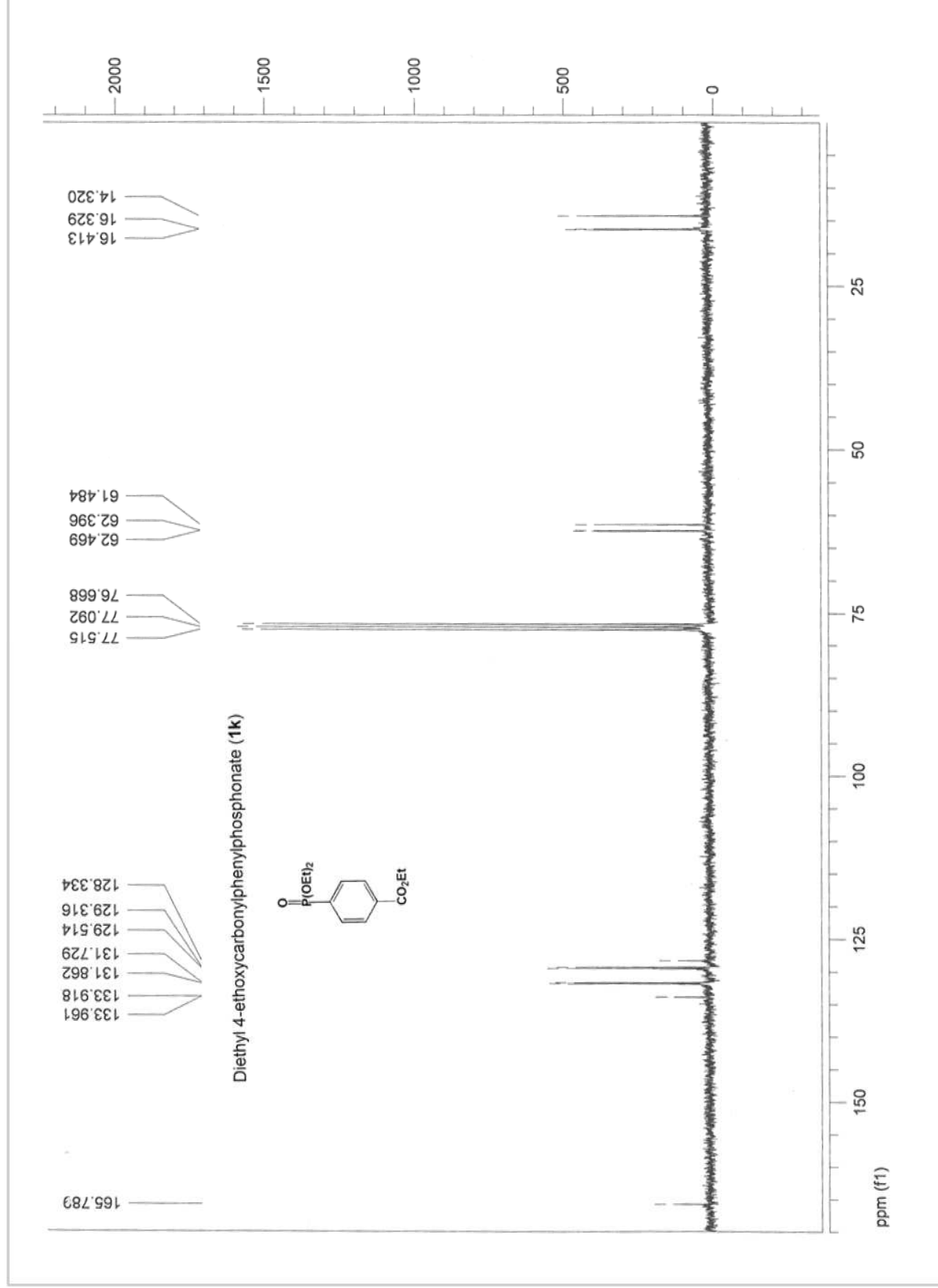
Diethyl 3-fluorophenylphosphonate (1j)

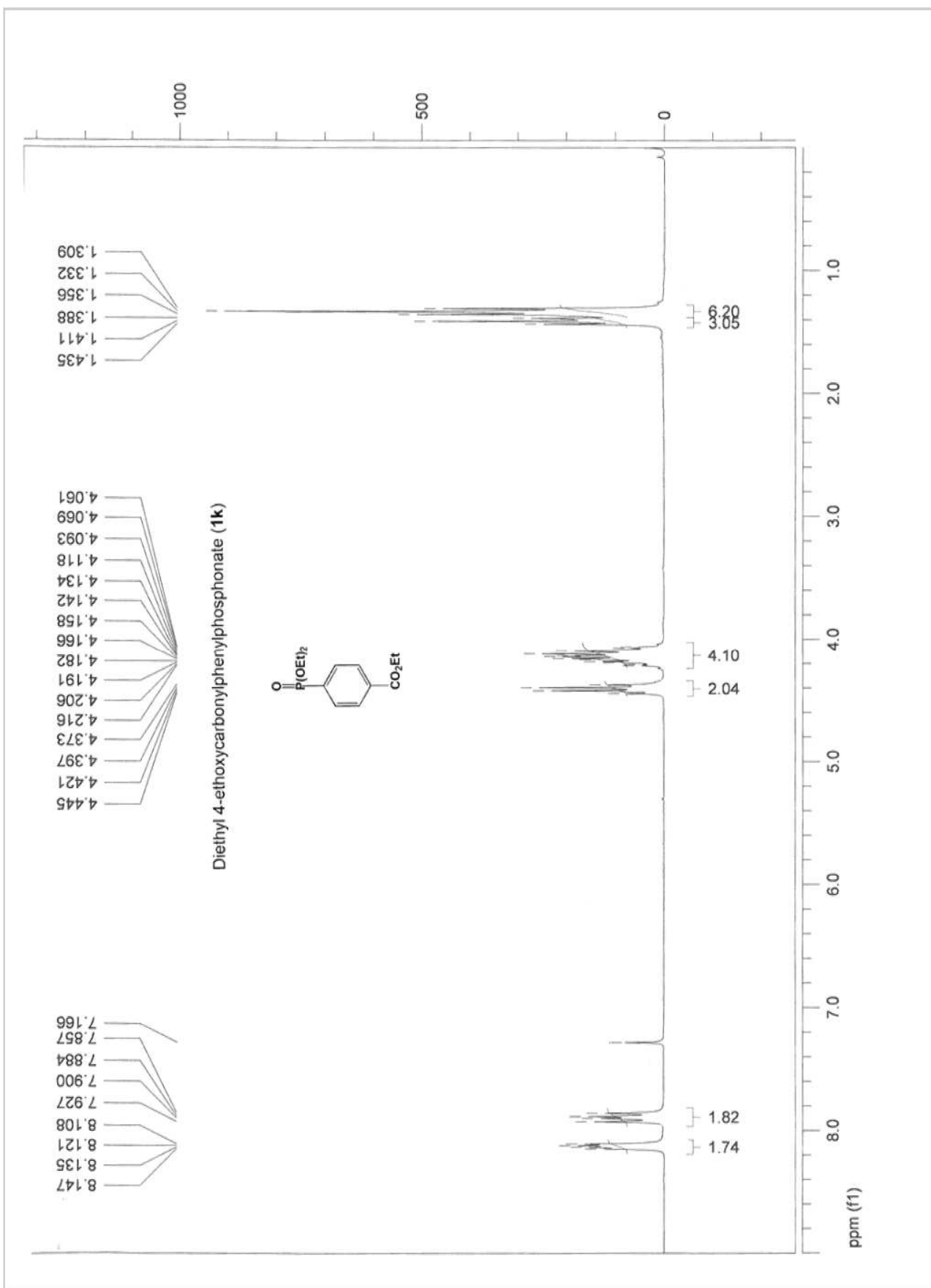




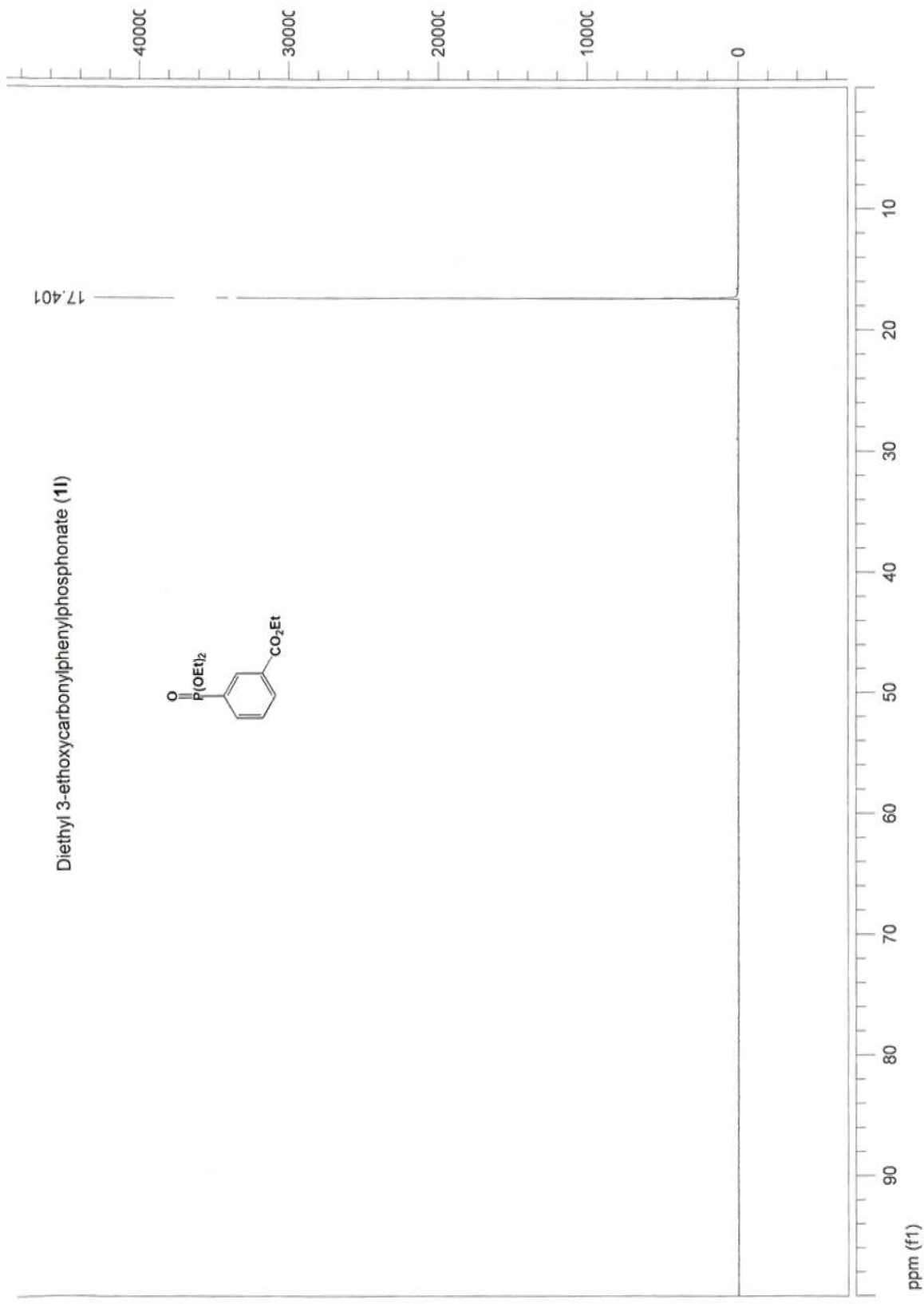
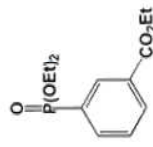


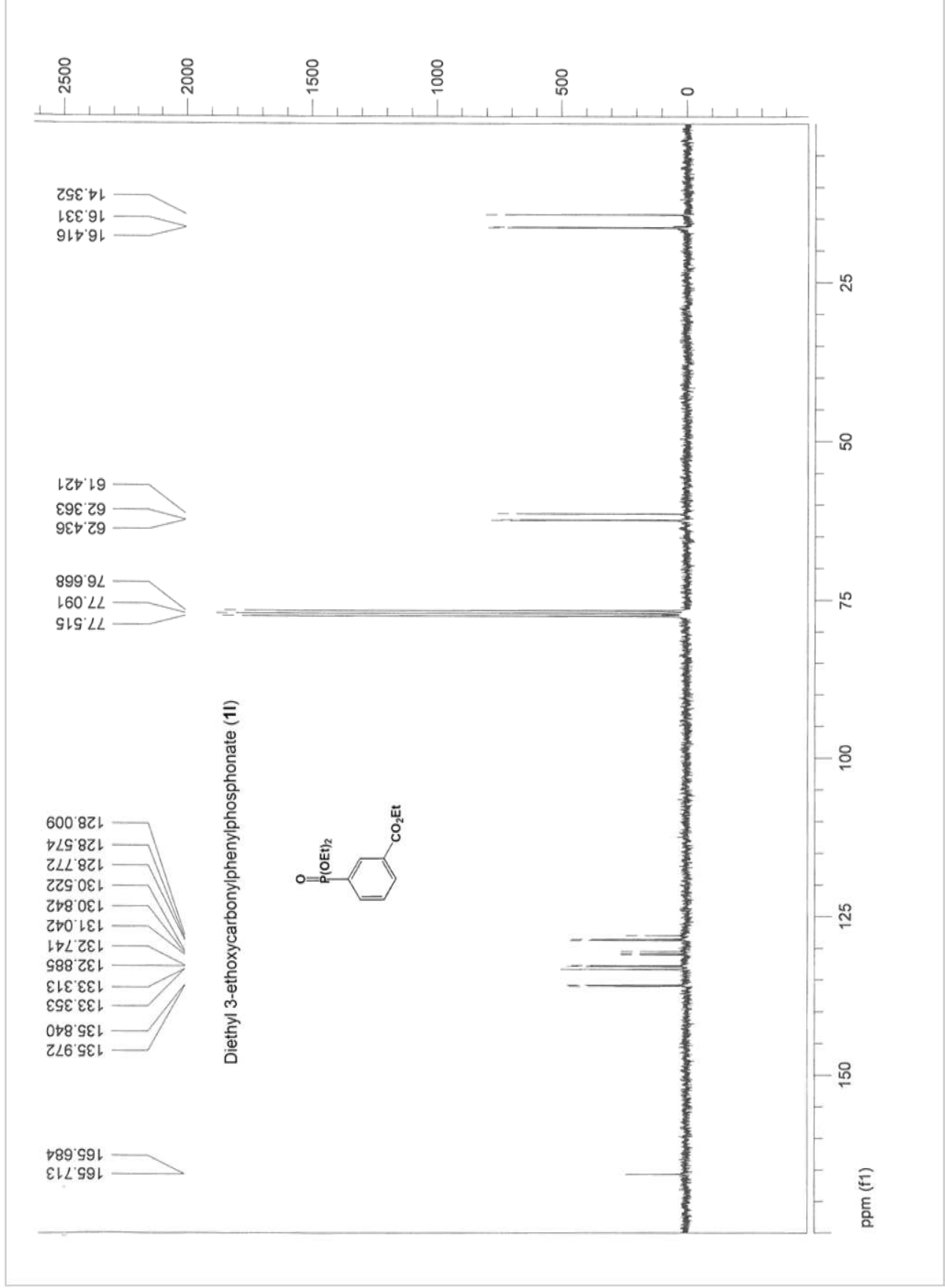


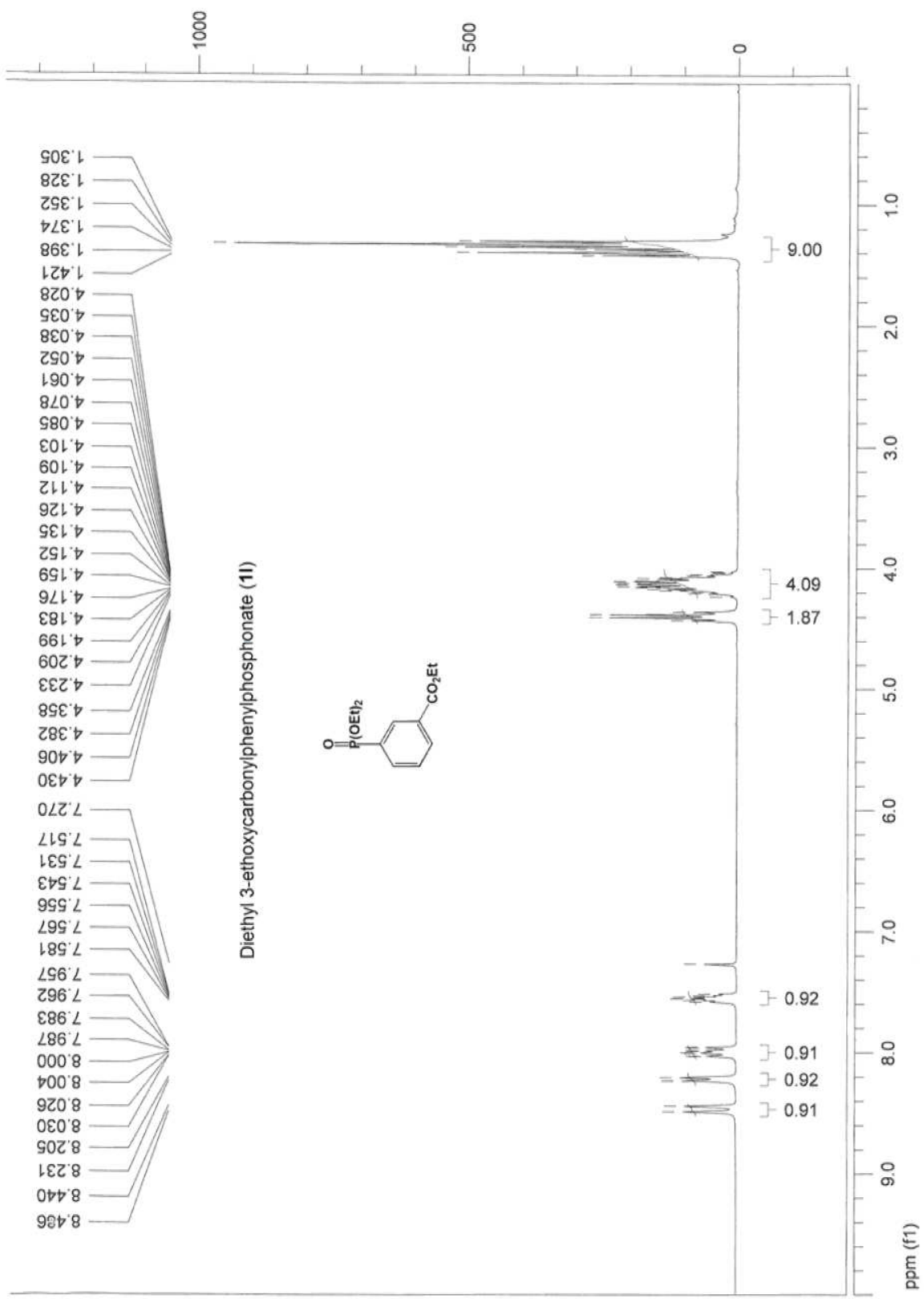


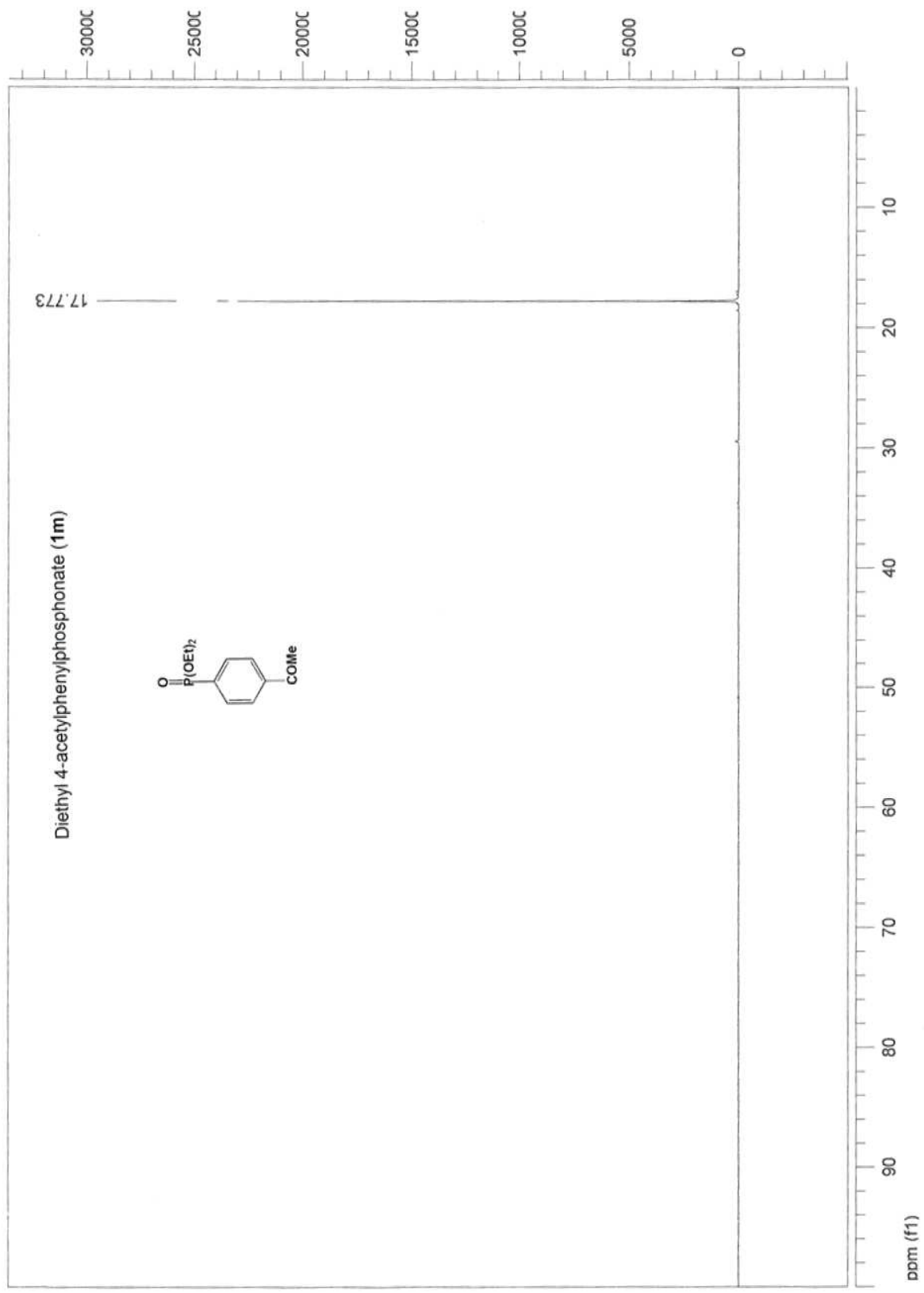


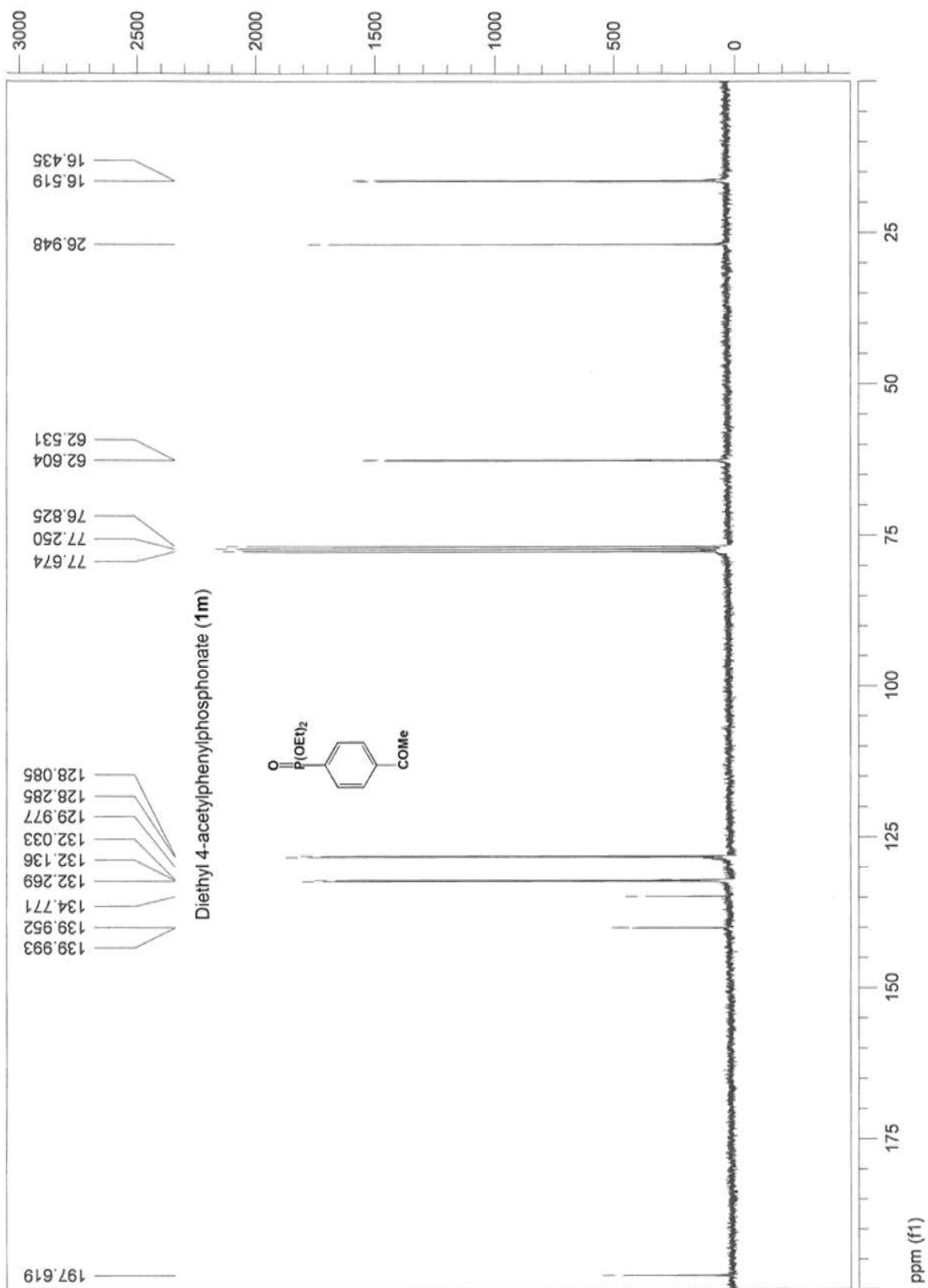
Diethyl 3-ethoxycarbonylphenylphosphonate (**11**)

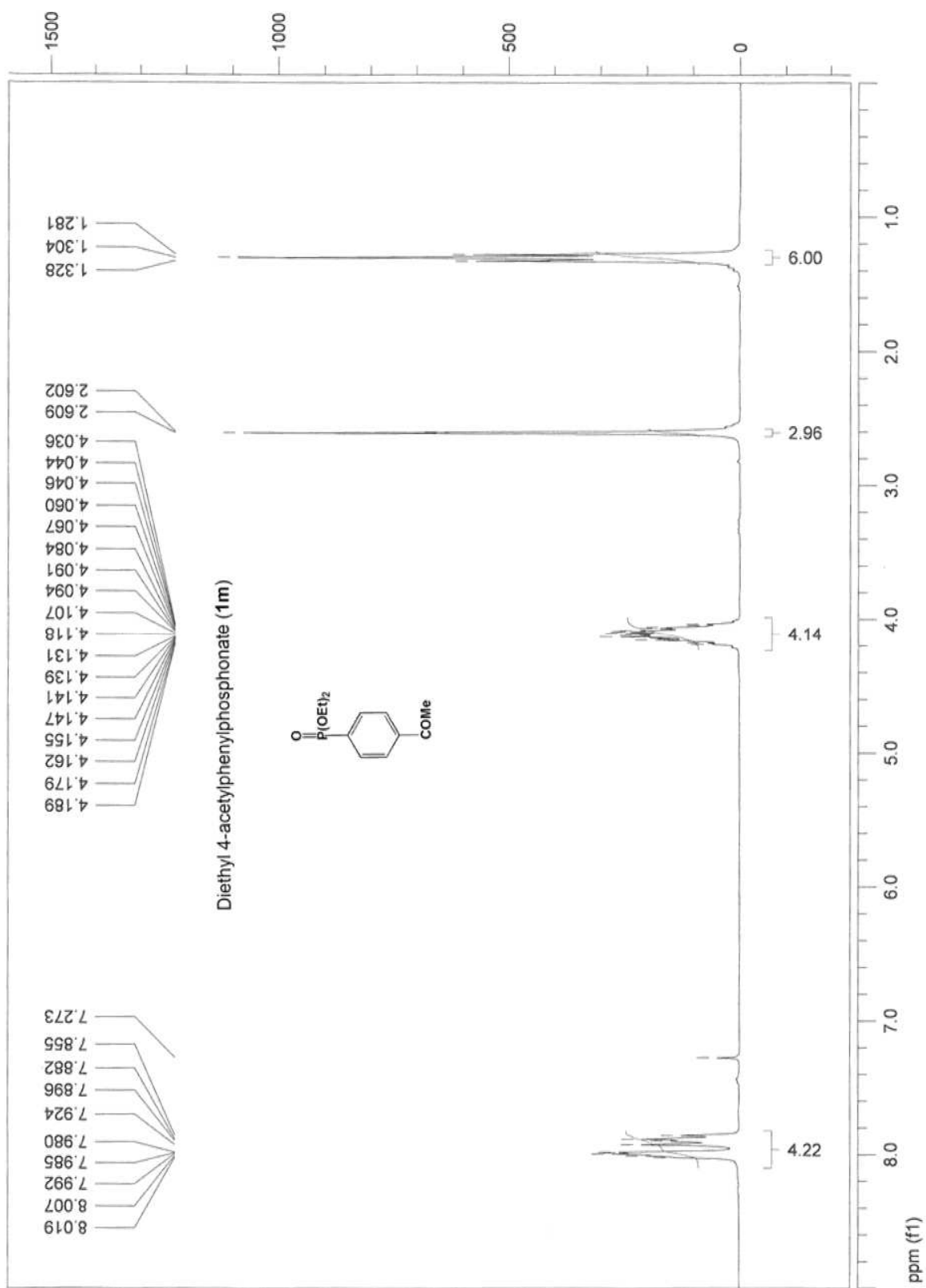




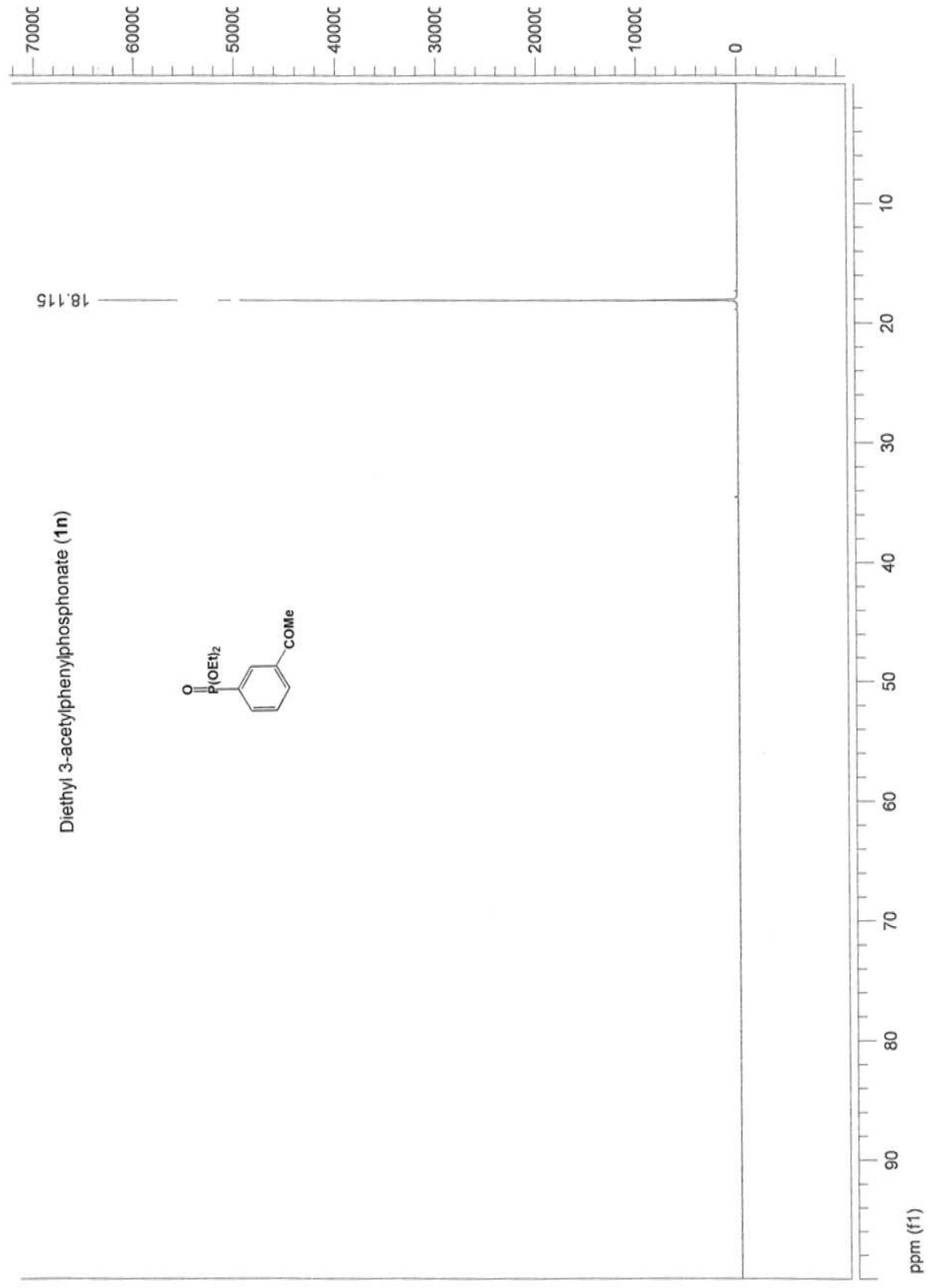
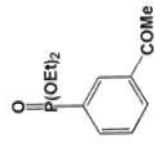


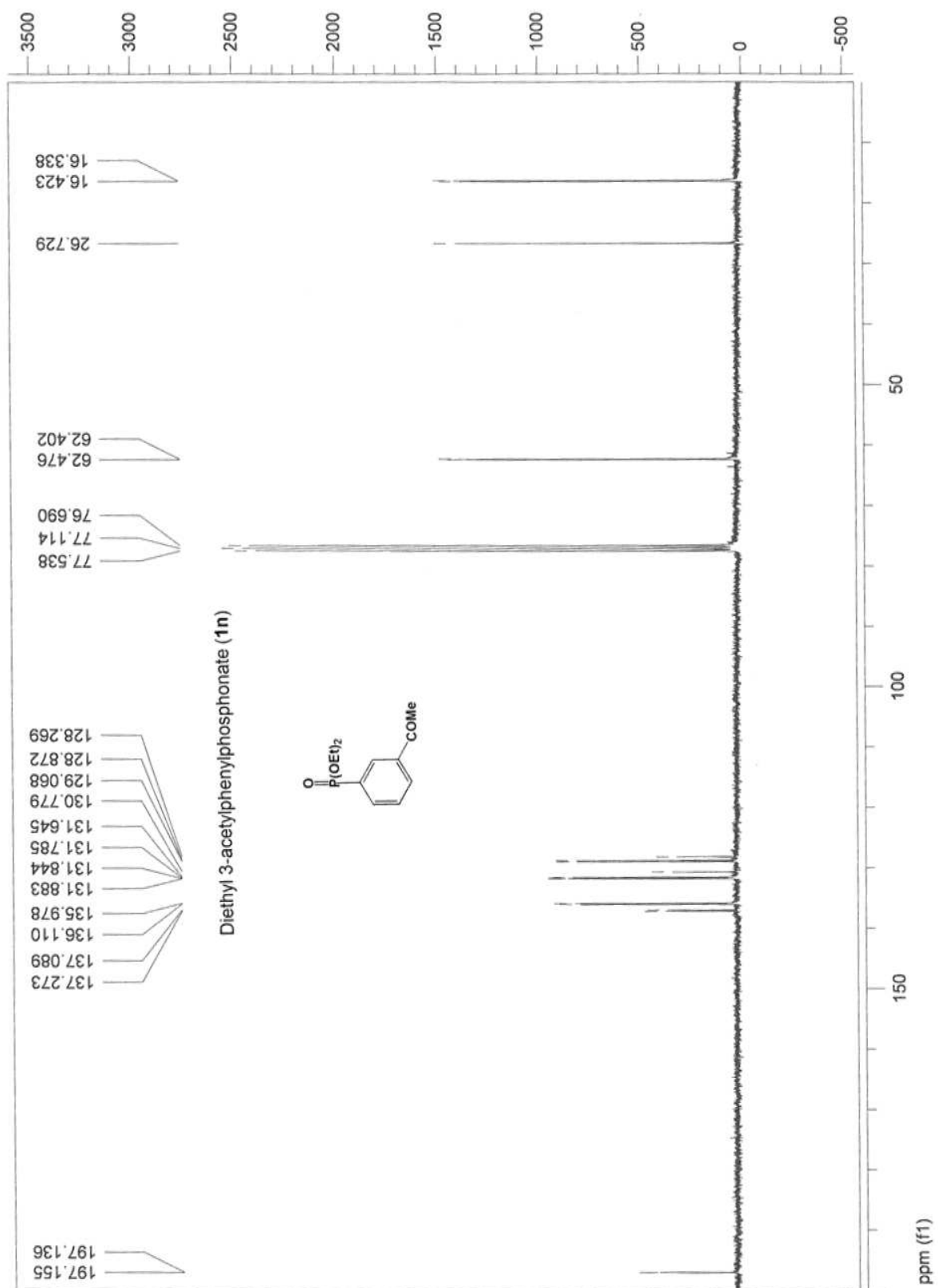


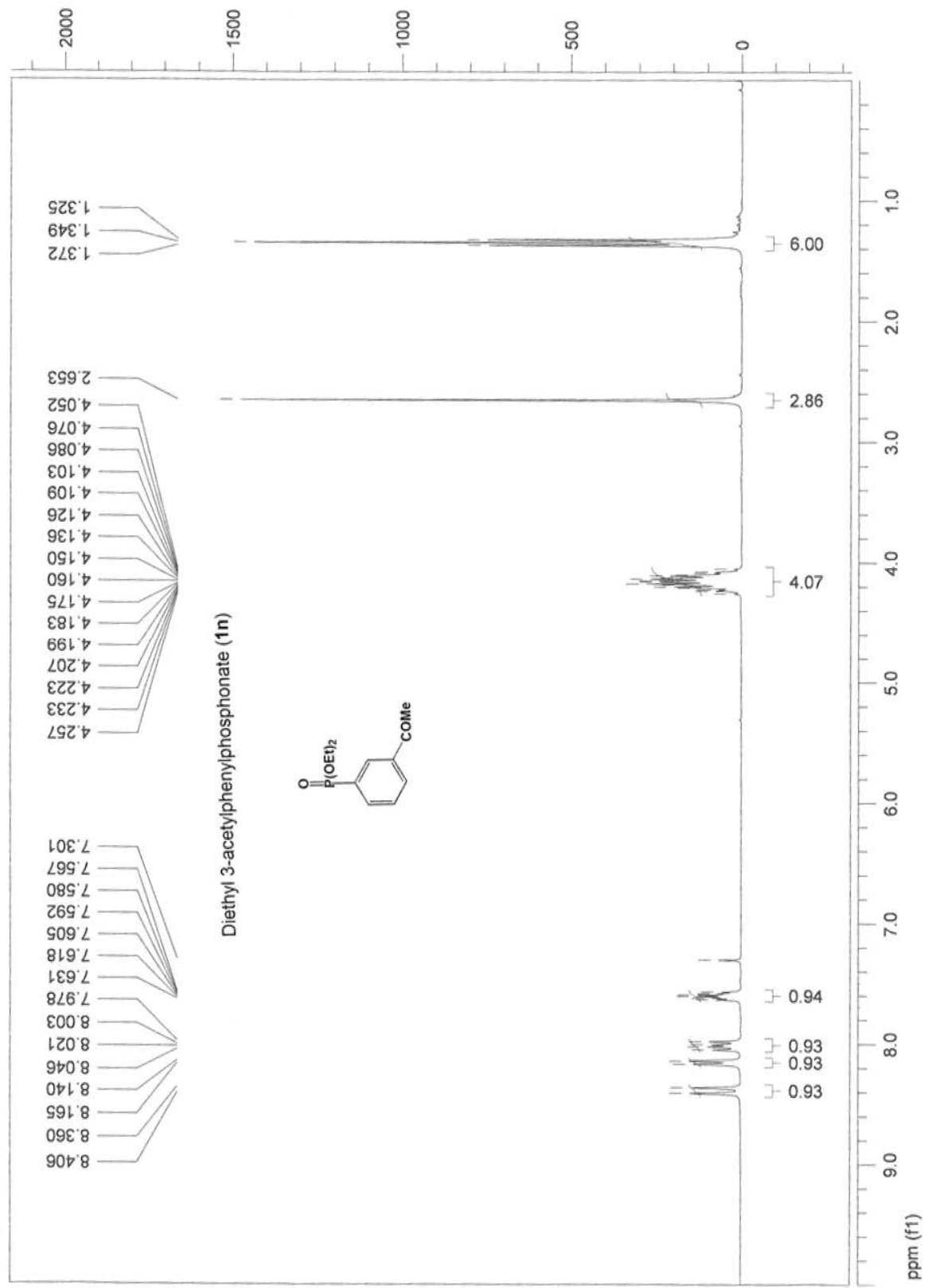




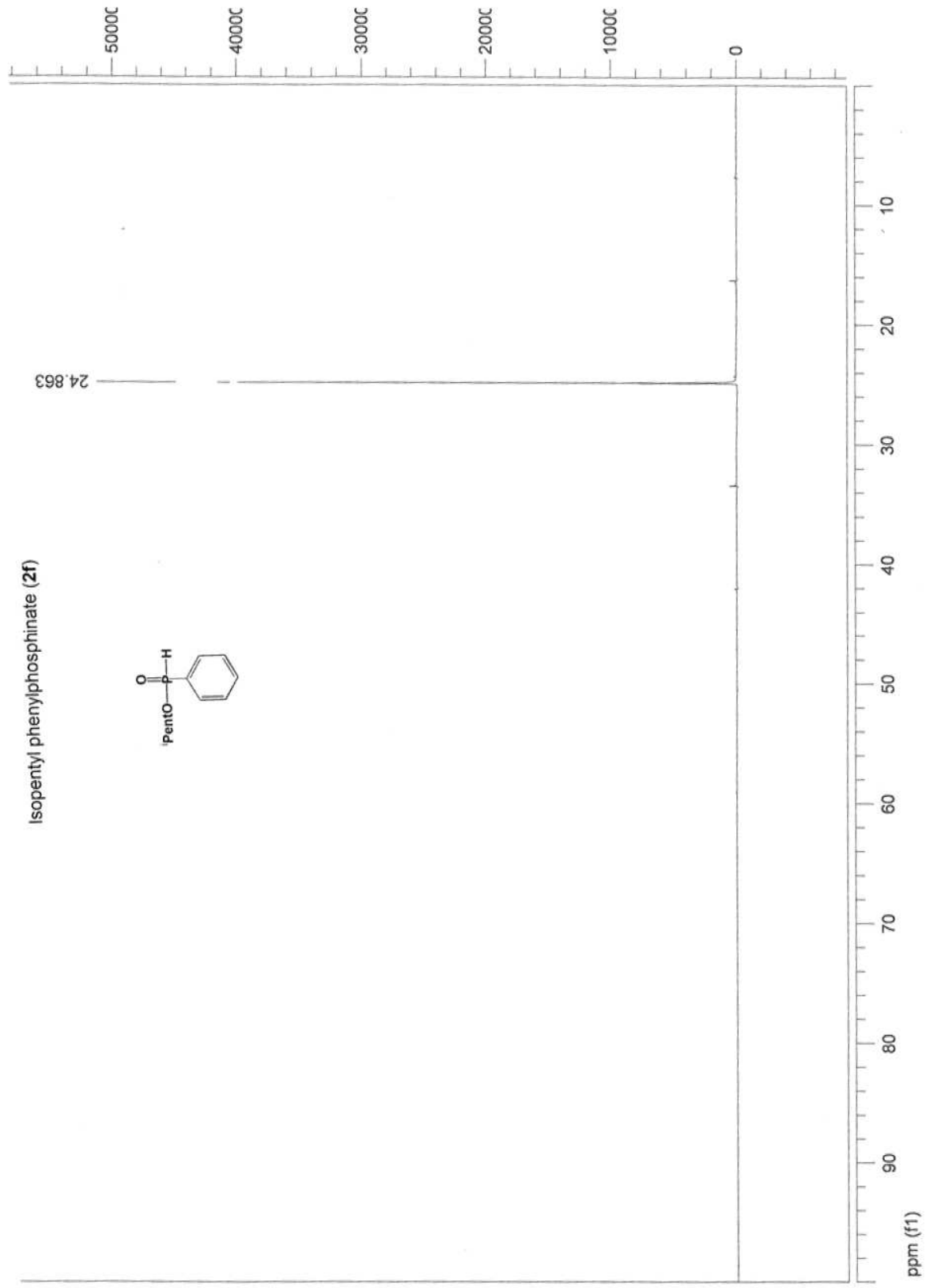
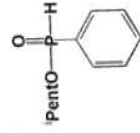
Diethyl 3-acetylphenylphosphonate (**1n**)

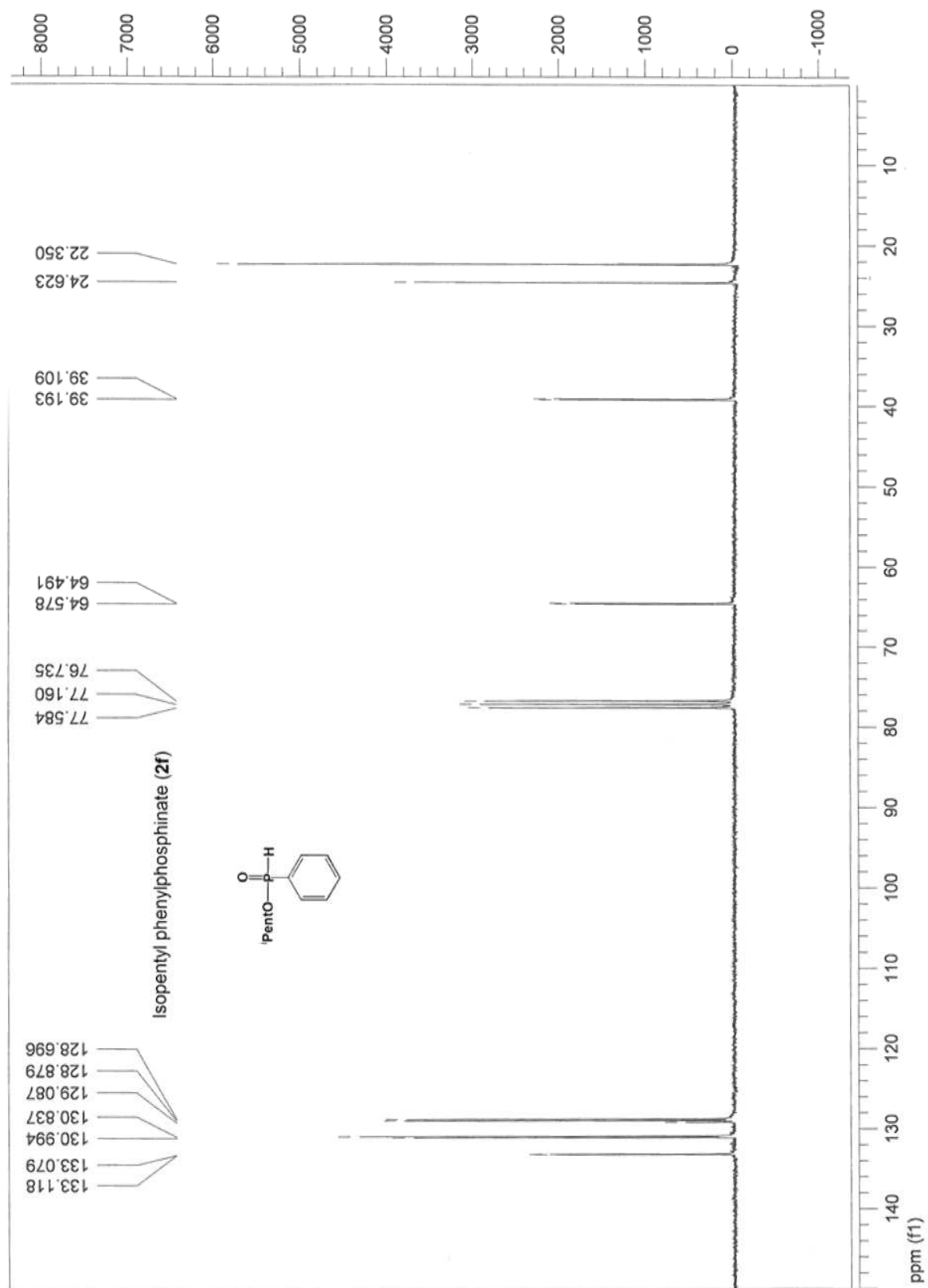


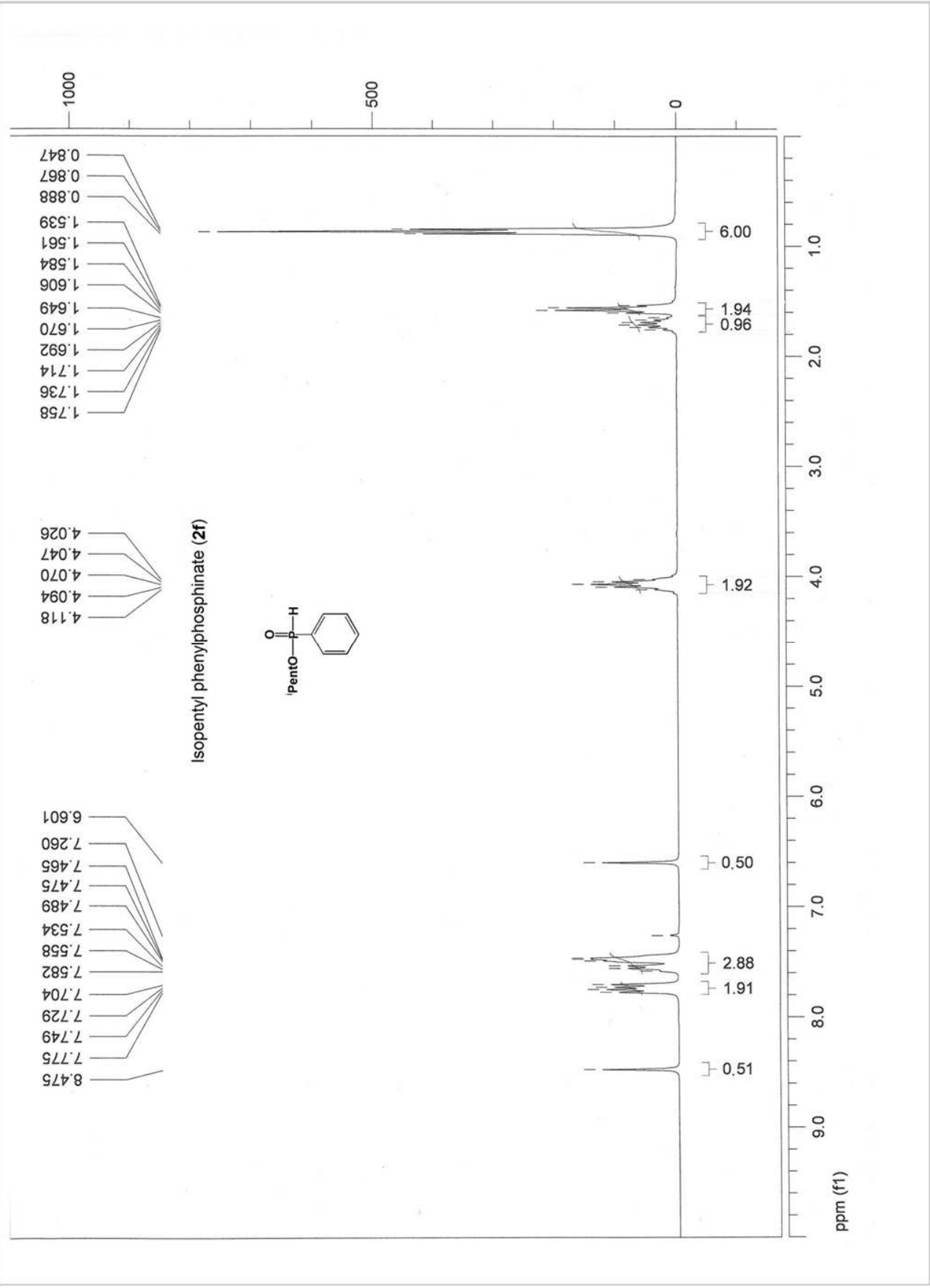




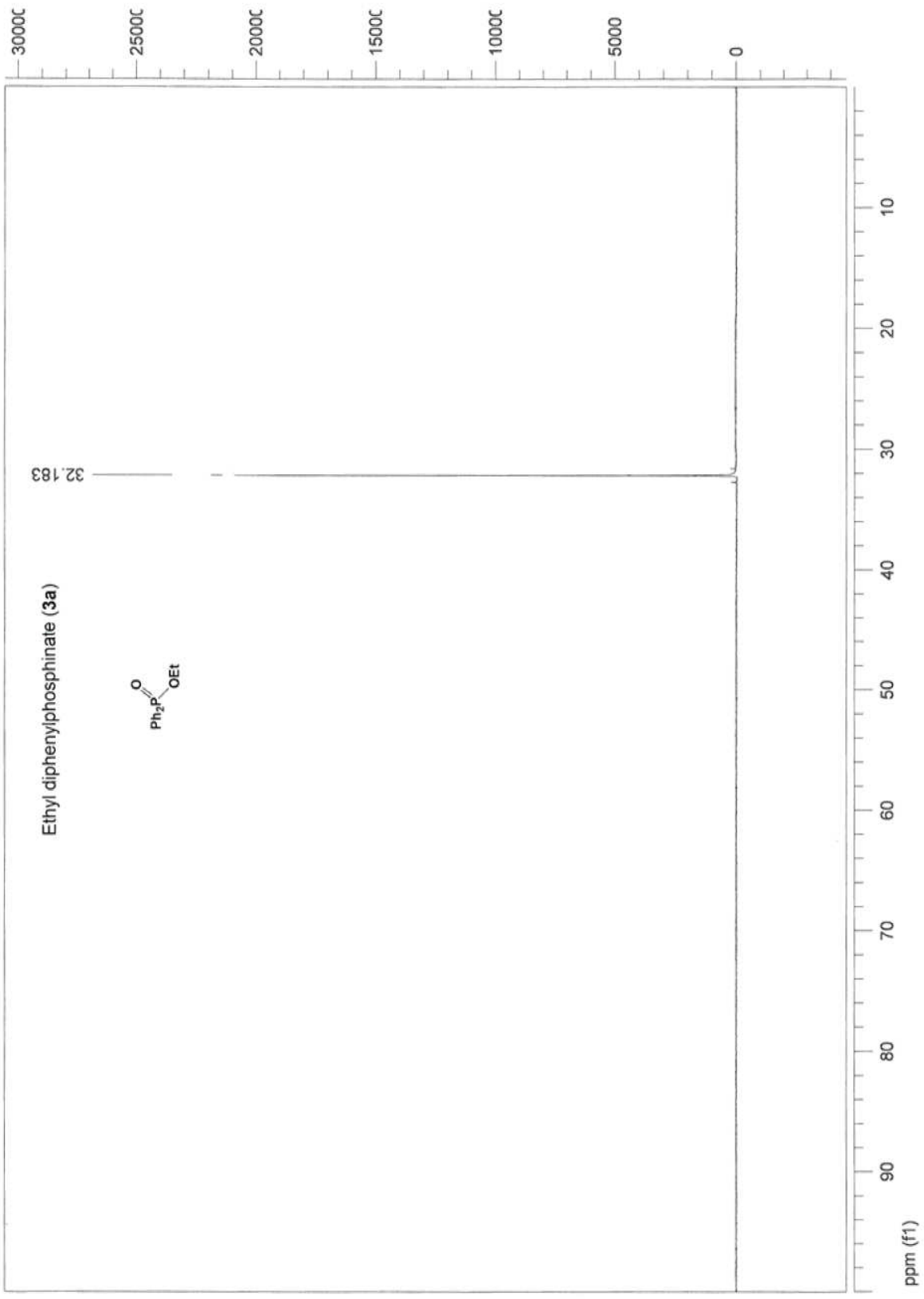
Isopentyl phenylphosphinate (2f)

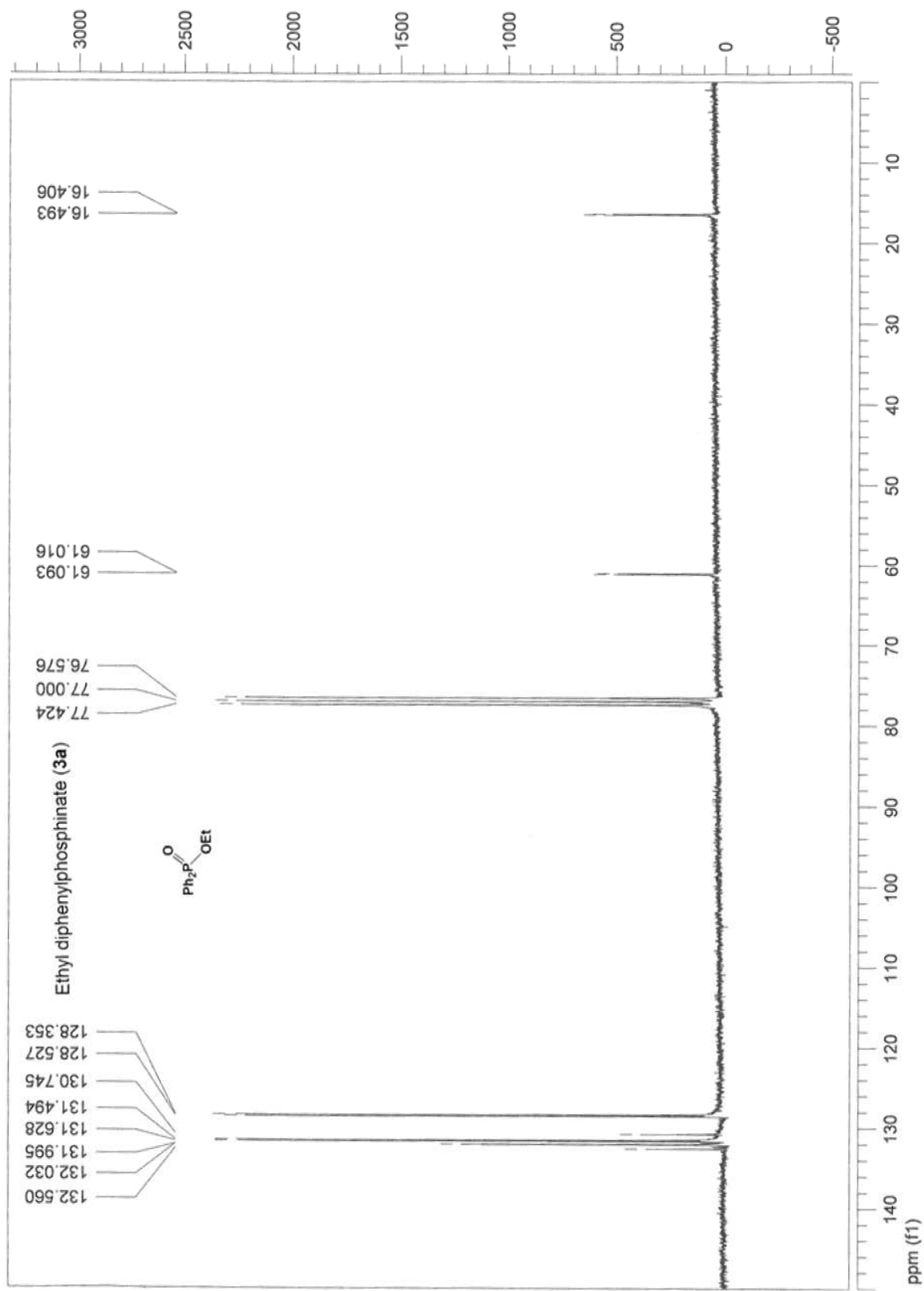


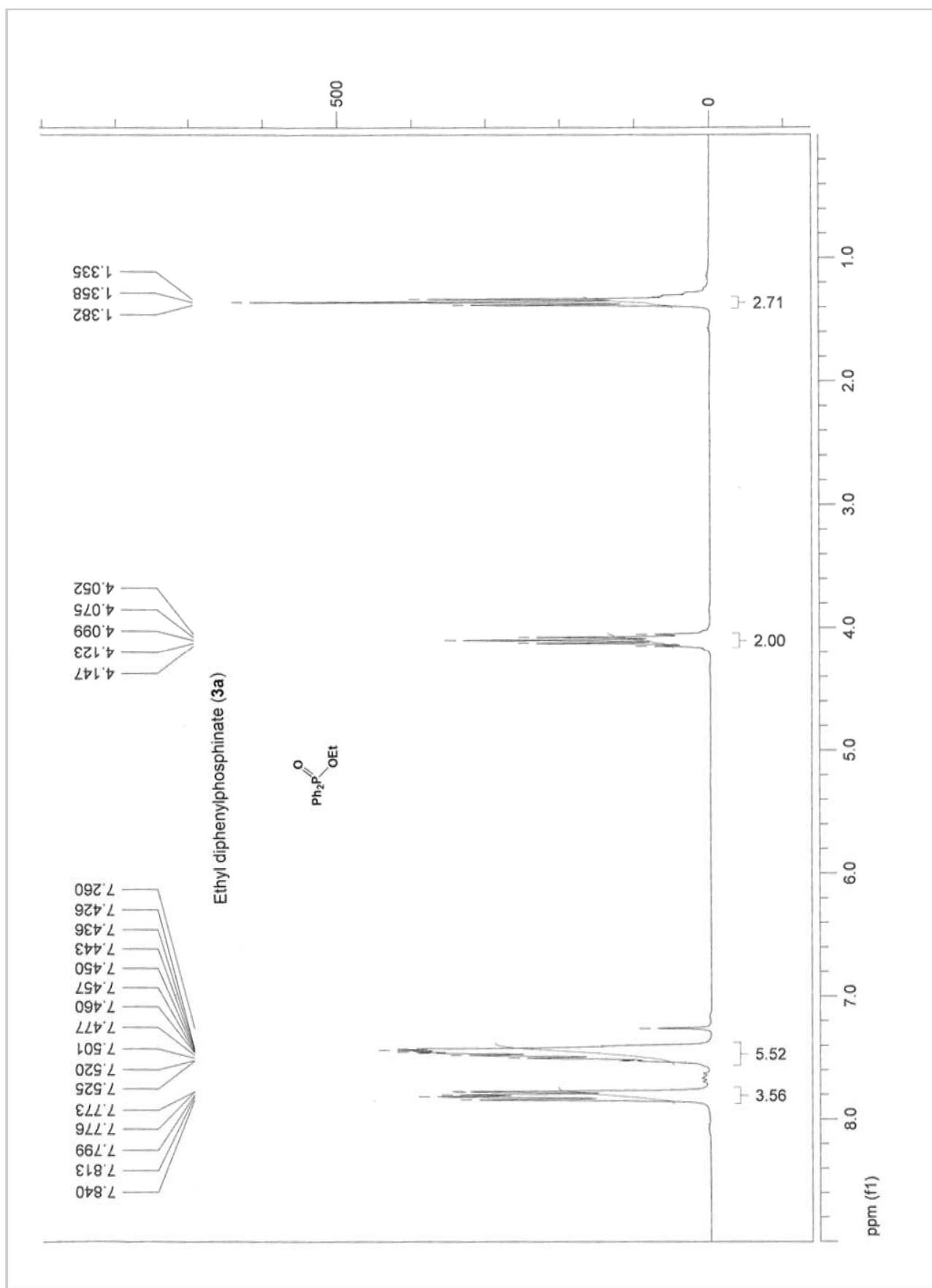


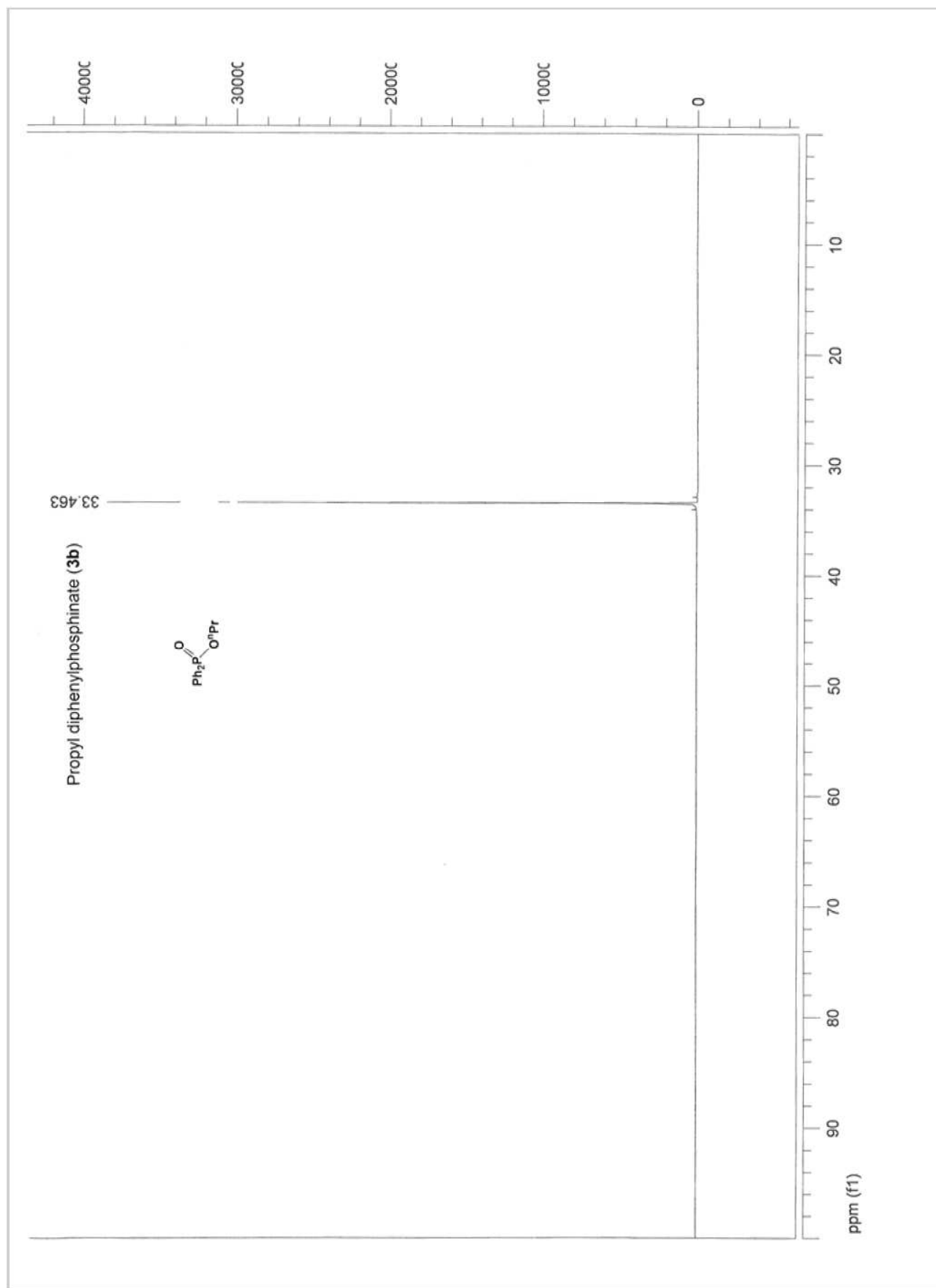


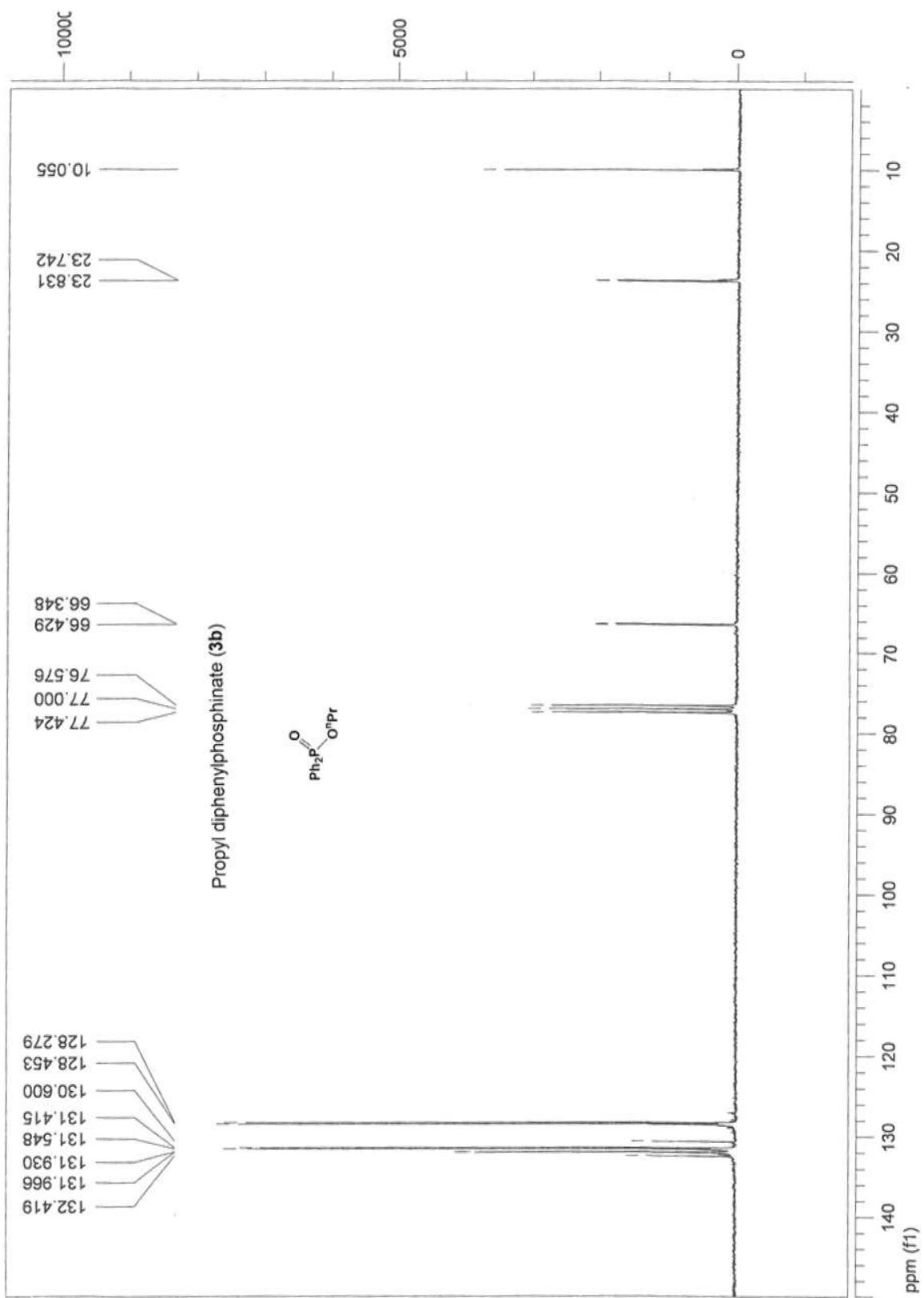
Ethyl diphenylphosphinate (3a)

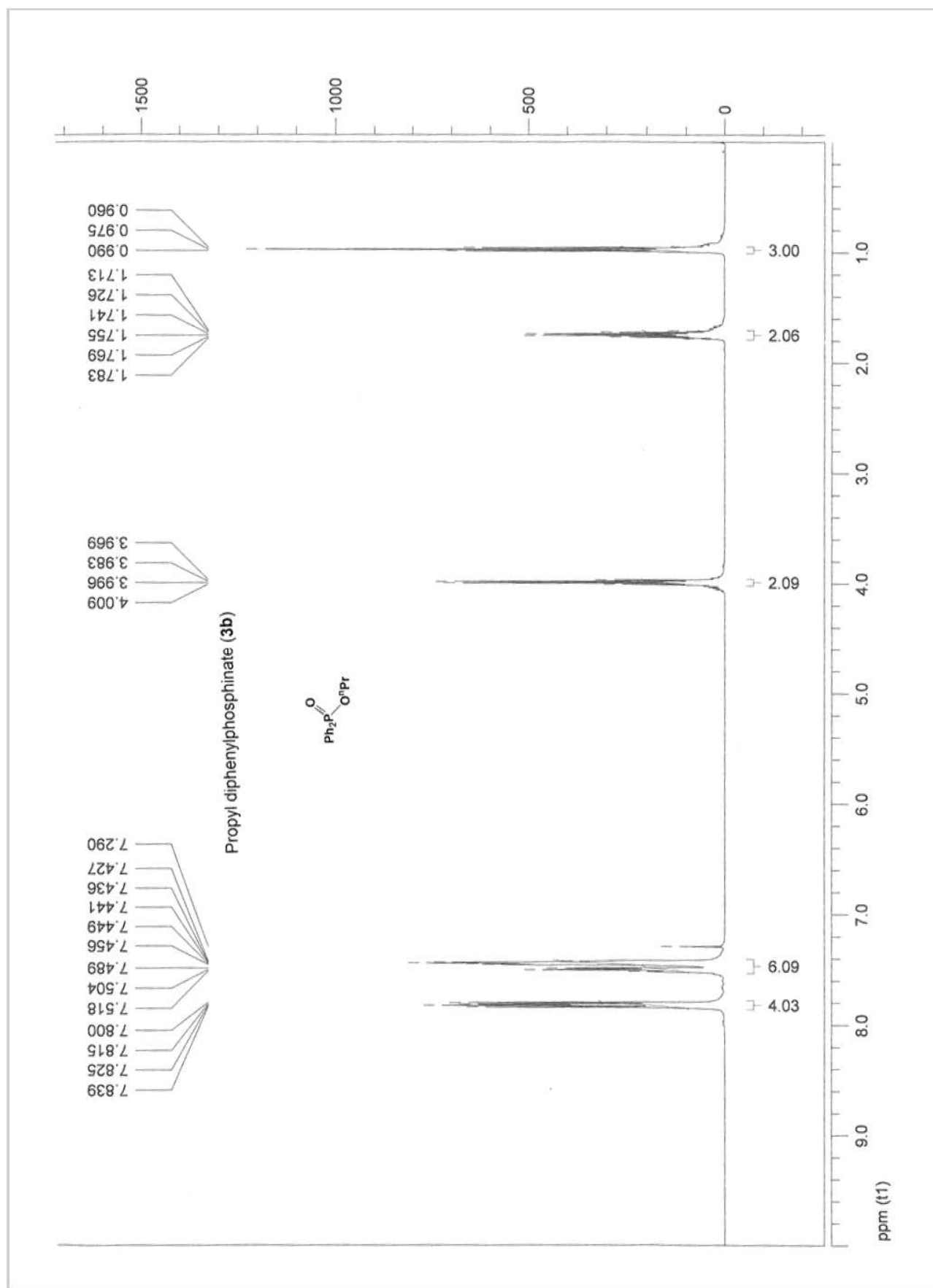




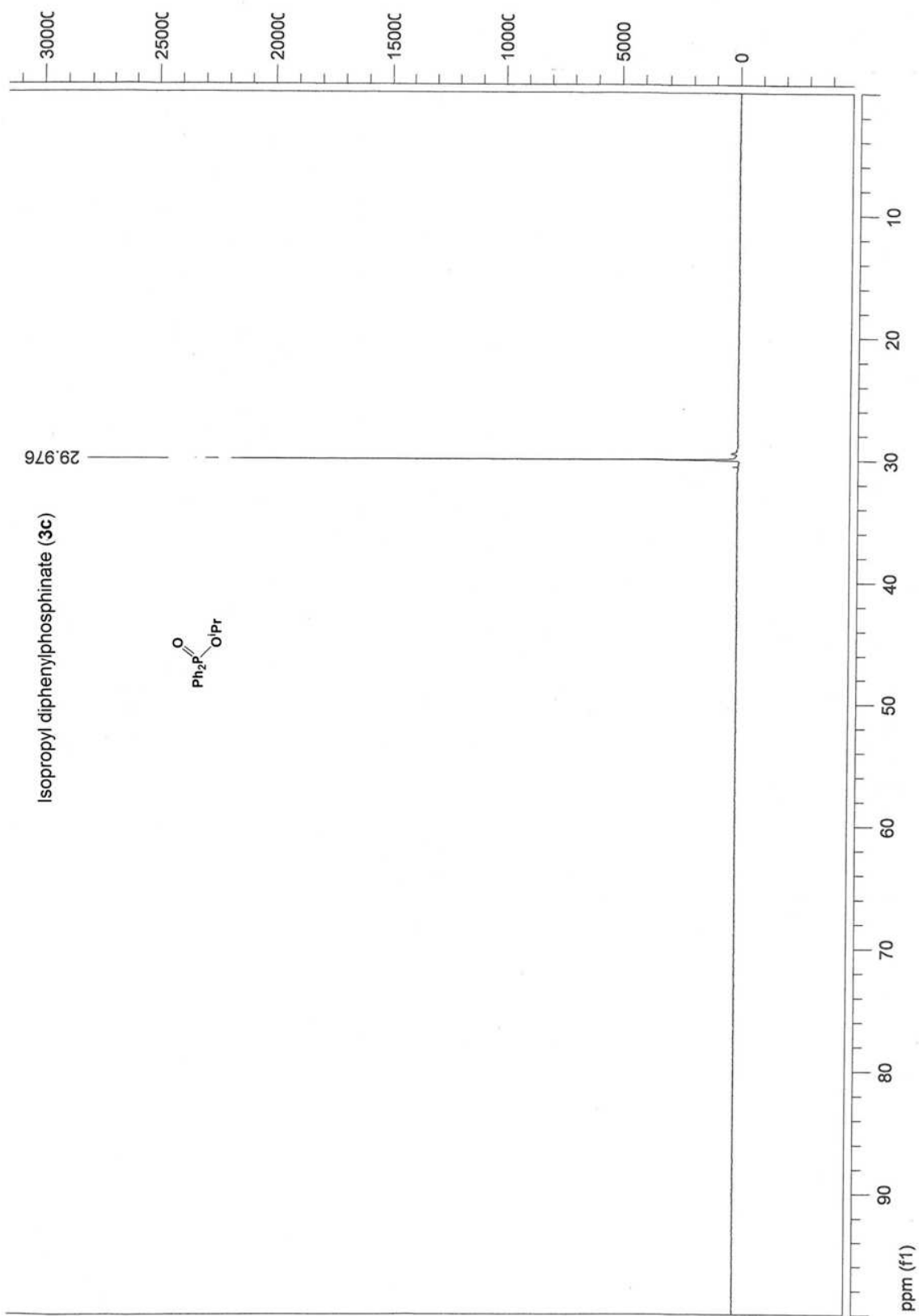
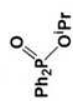


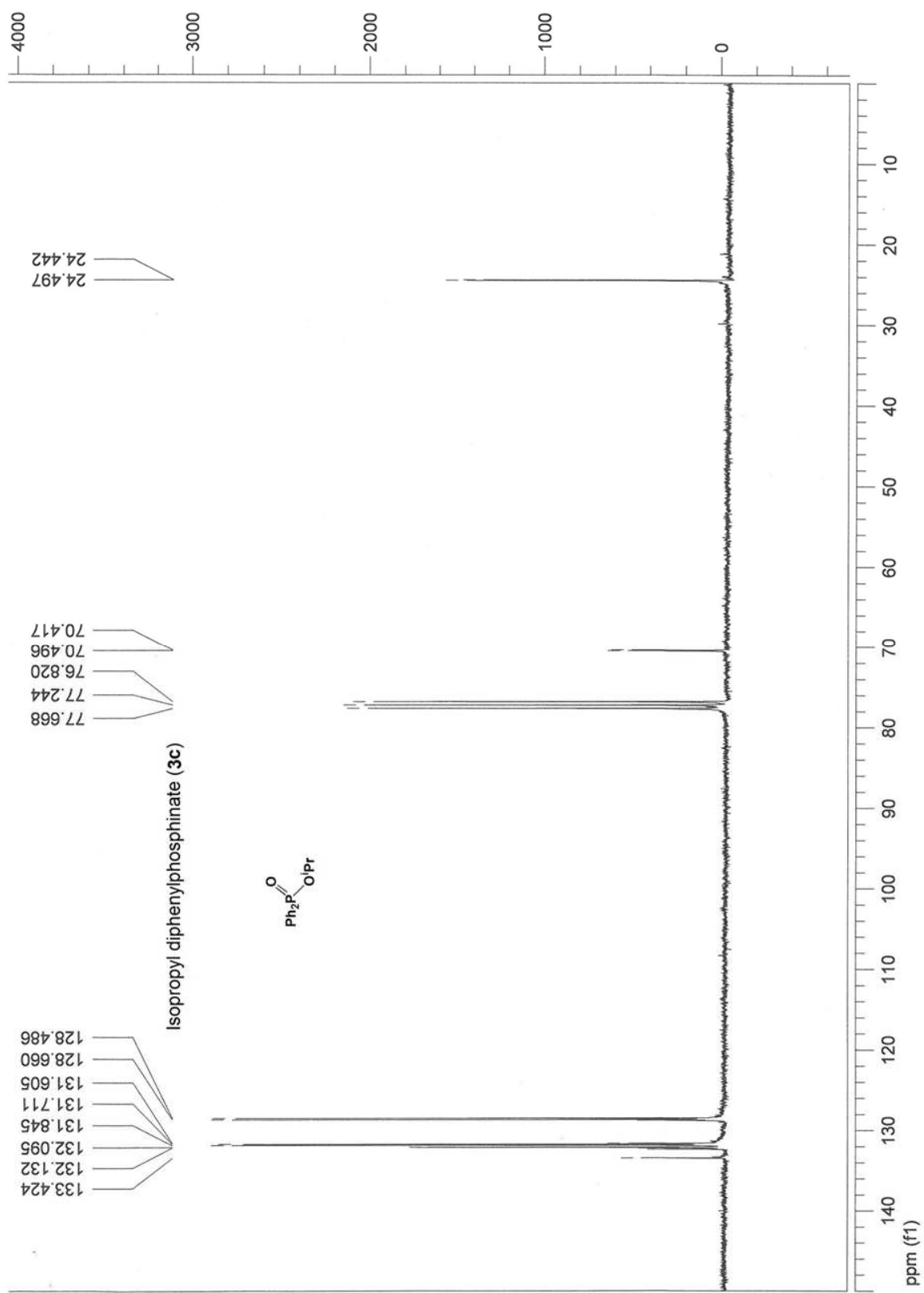


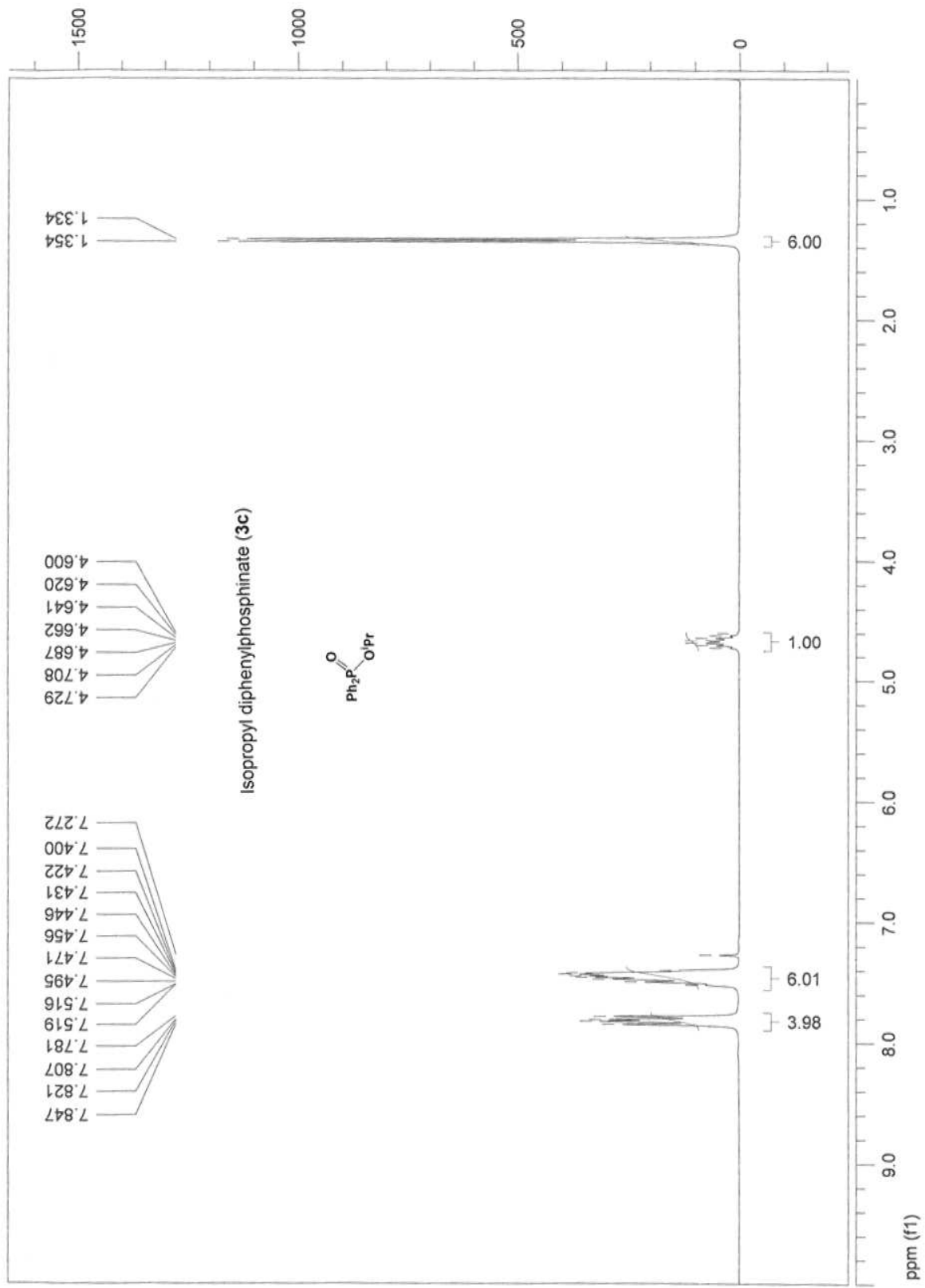


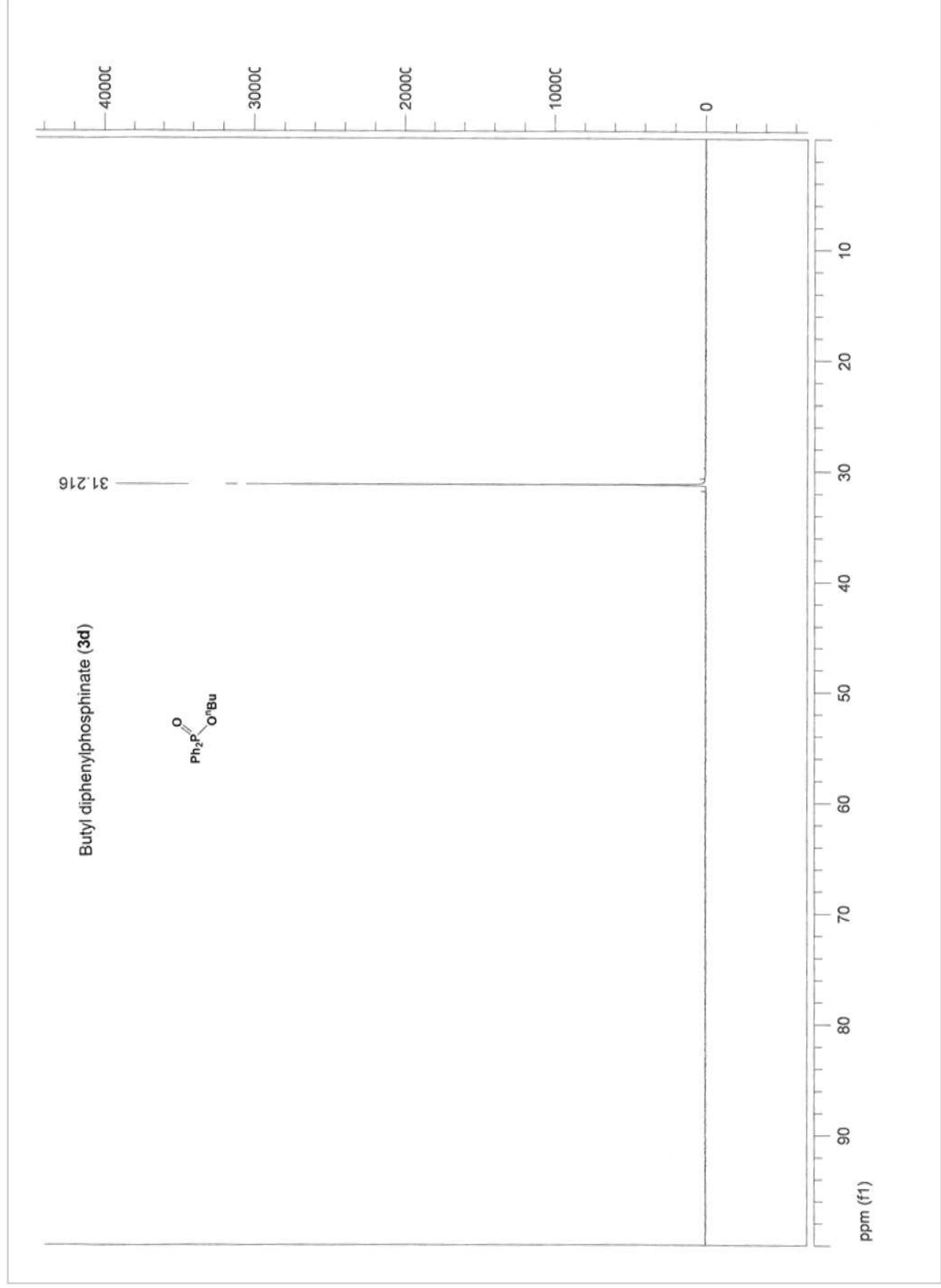


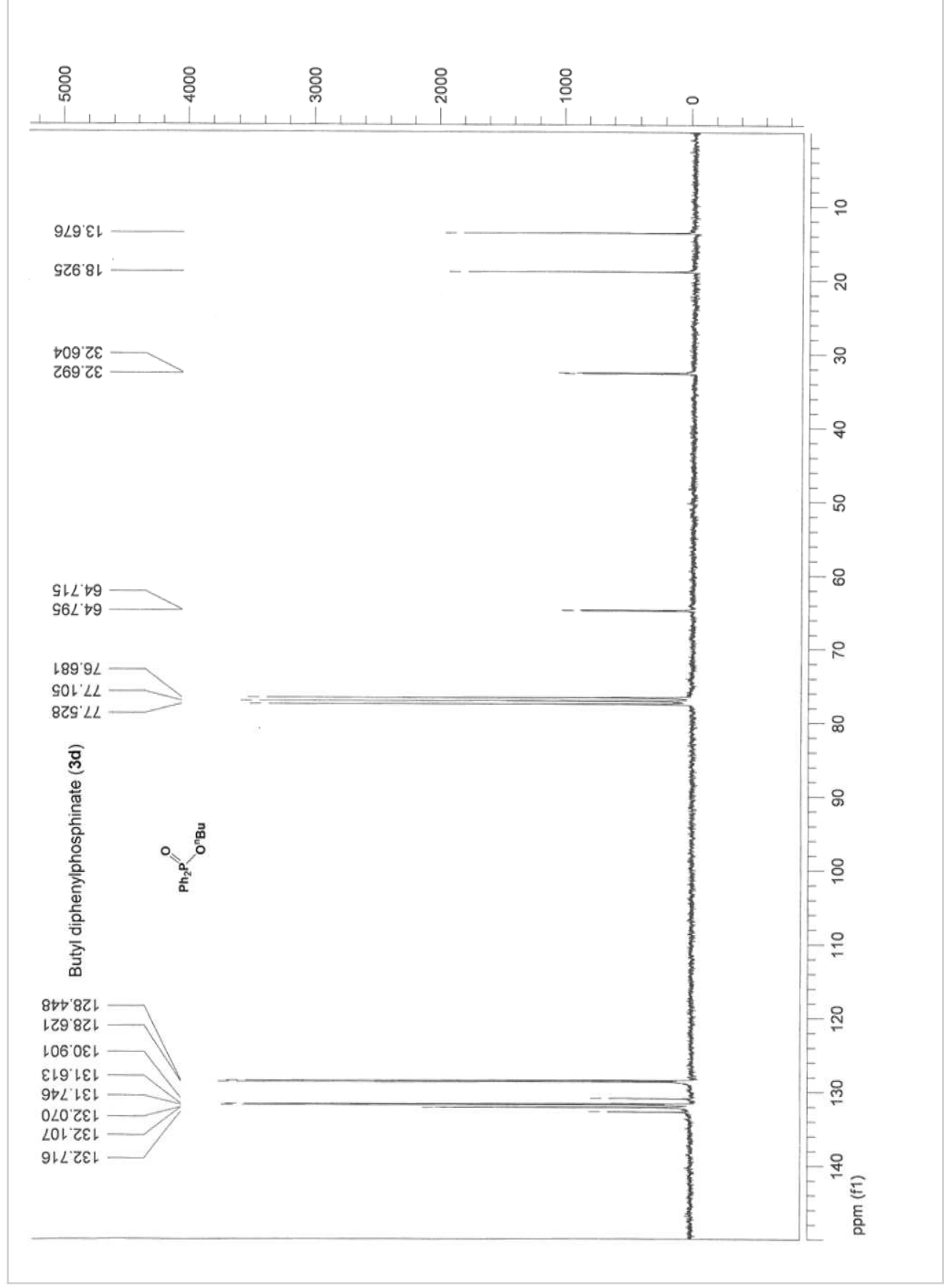
Isopropyl diphenylphosphinate (3c)

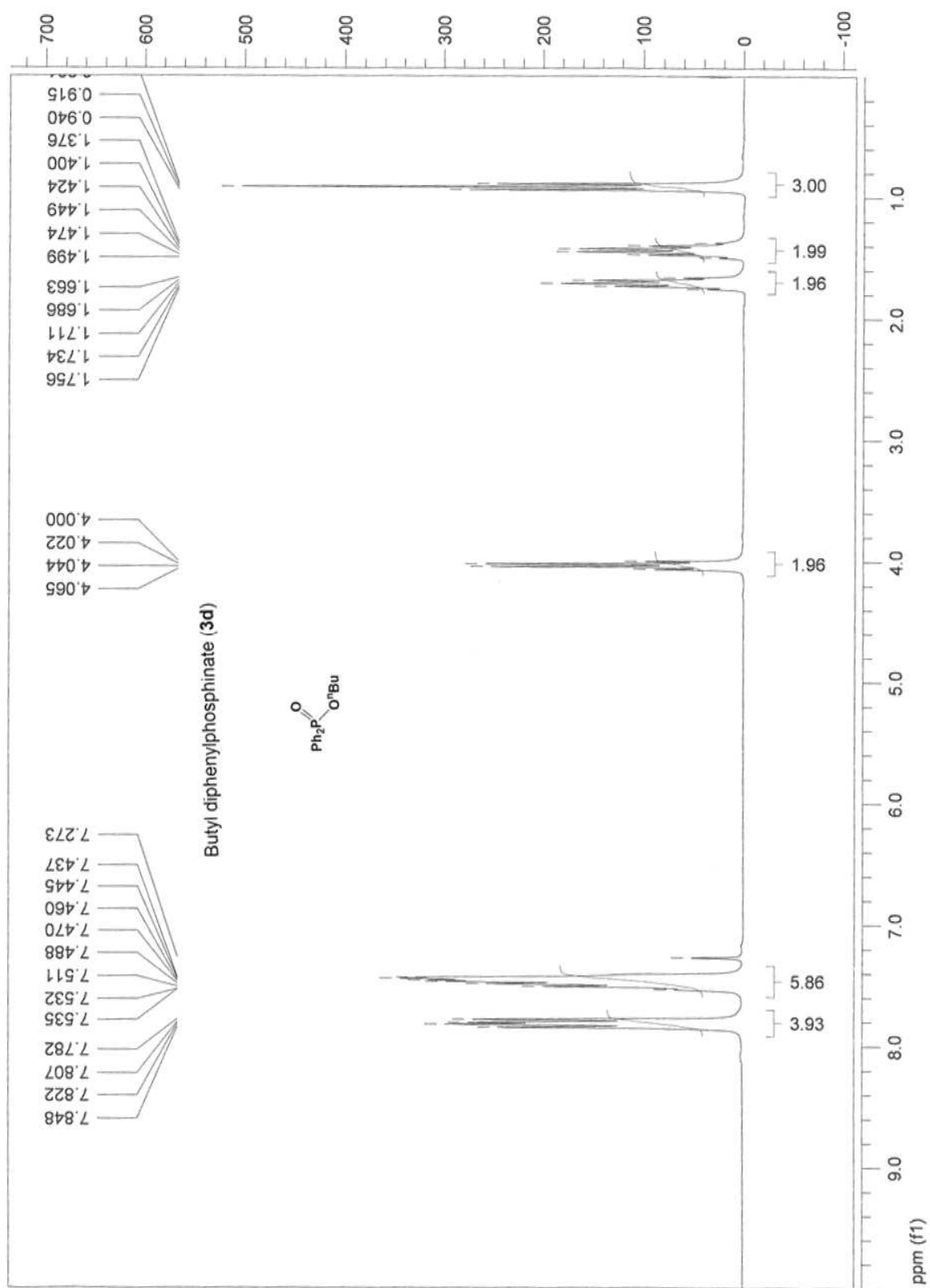




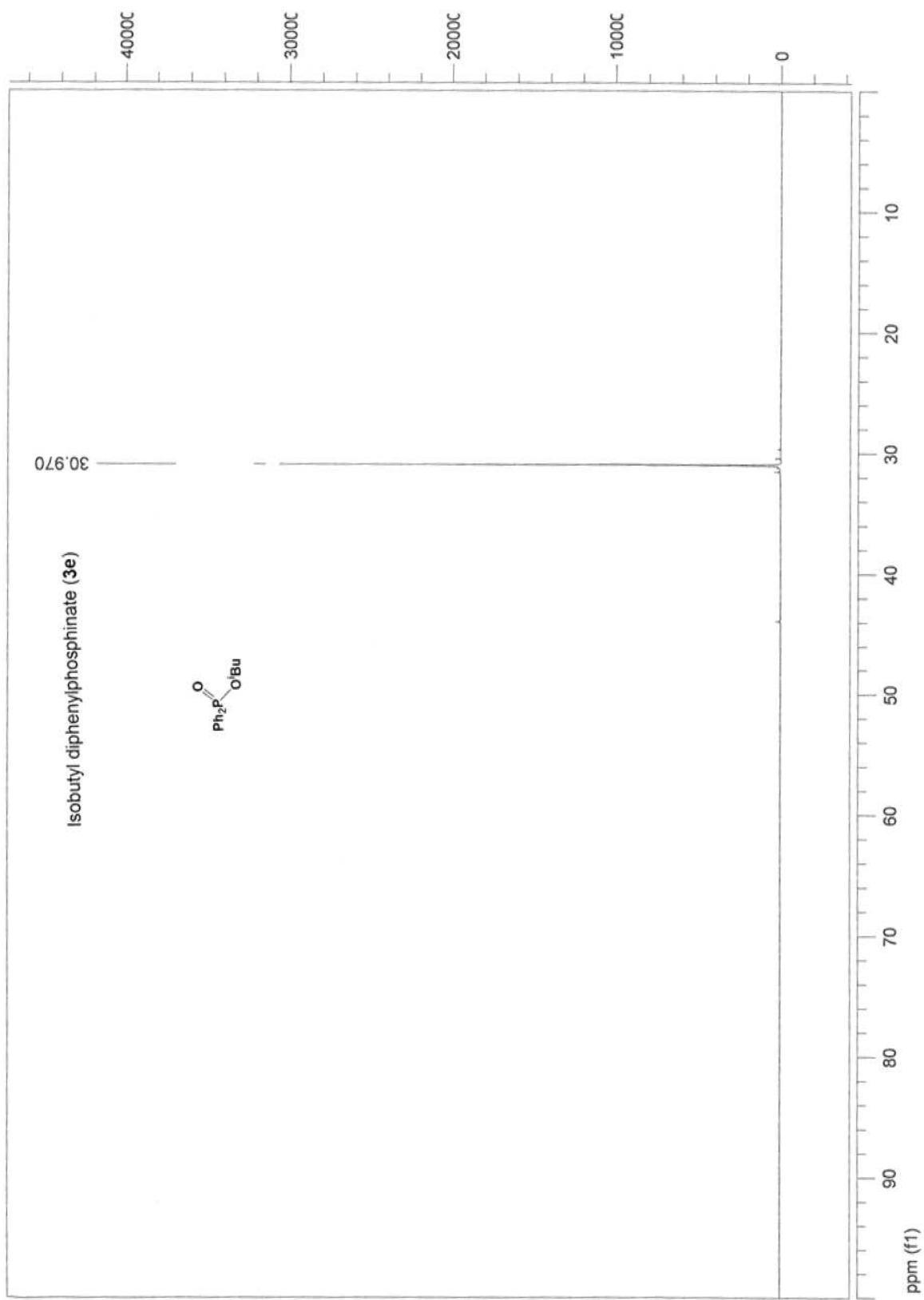


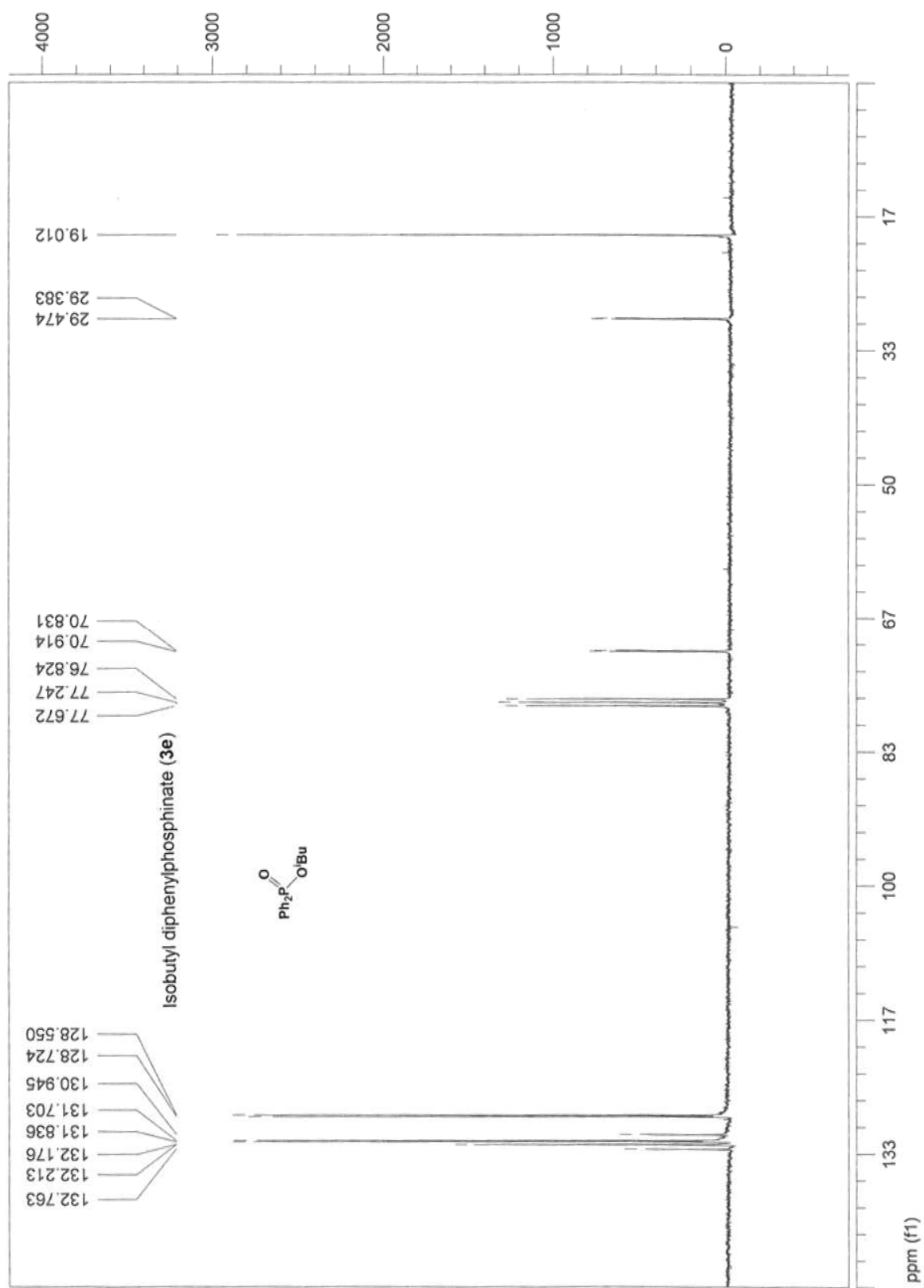


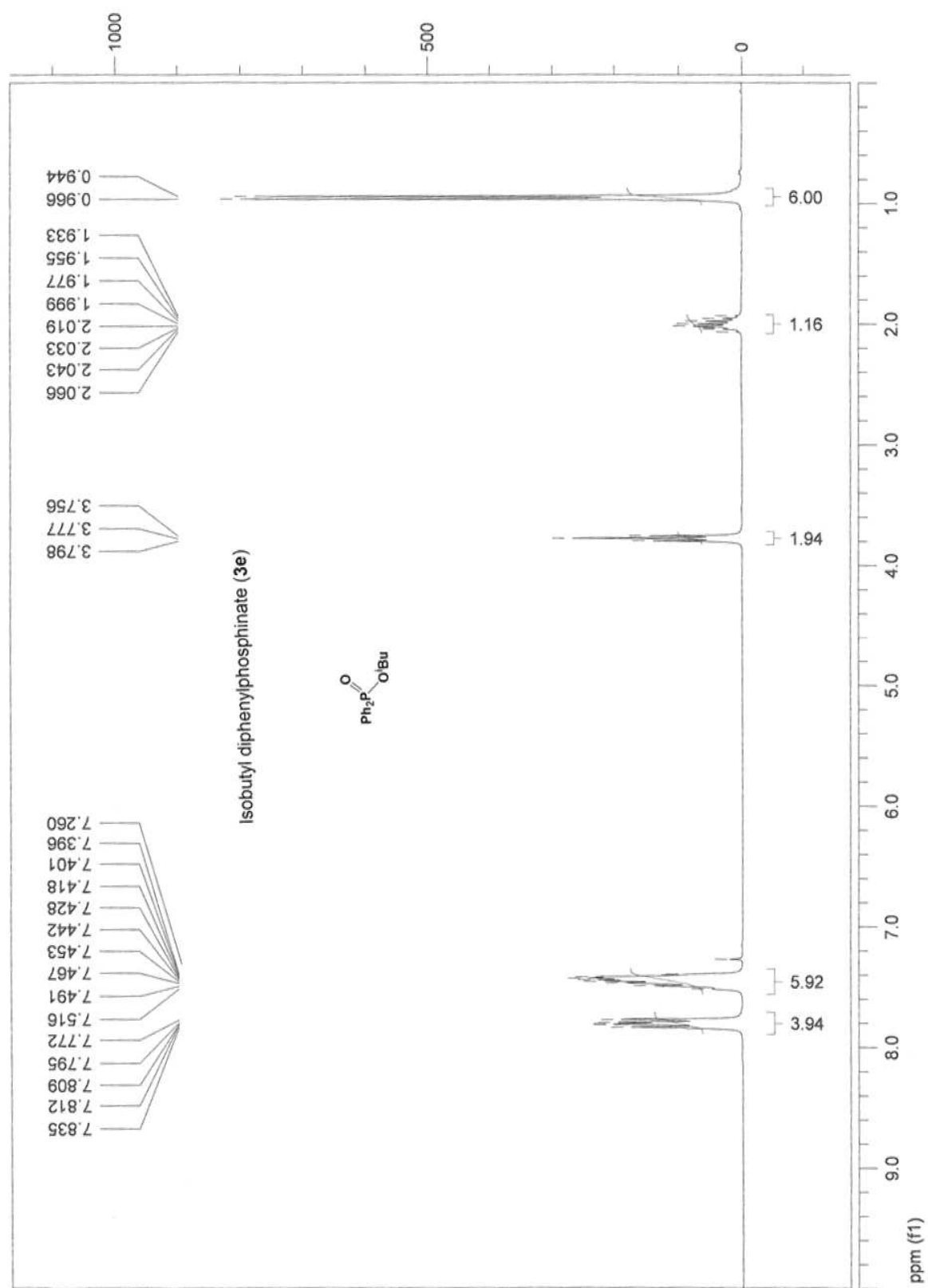




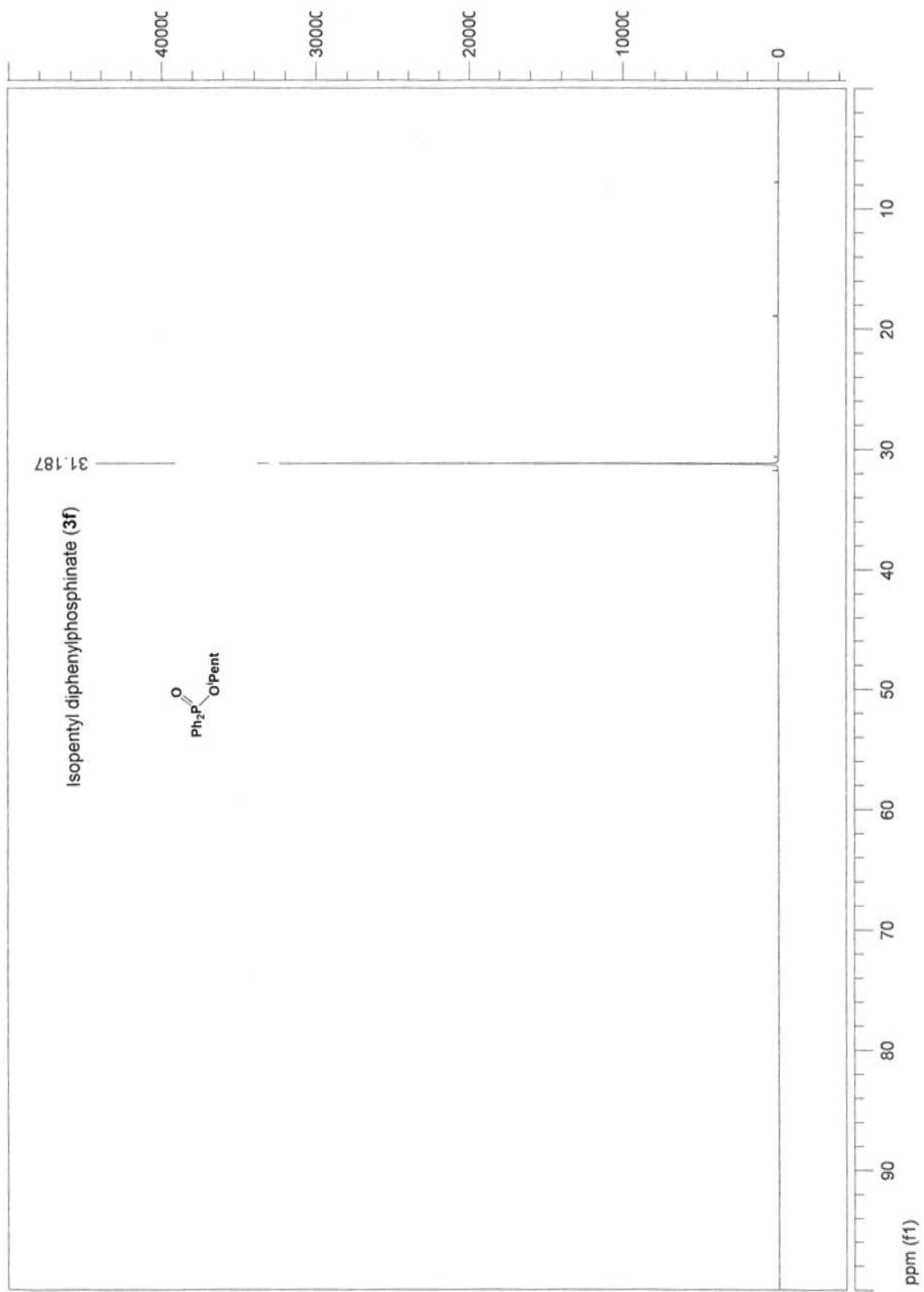
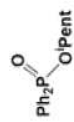
Isobutyl diphenylphosphinate (3e)

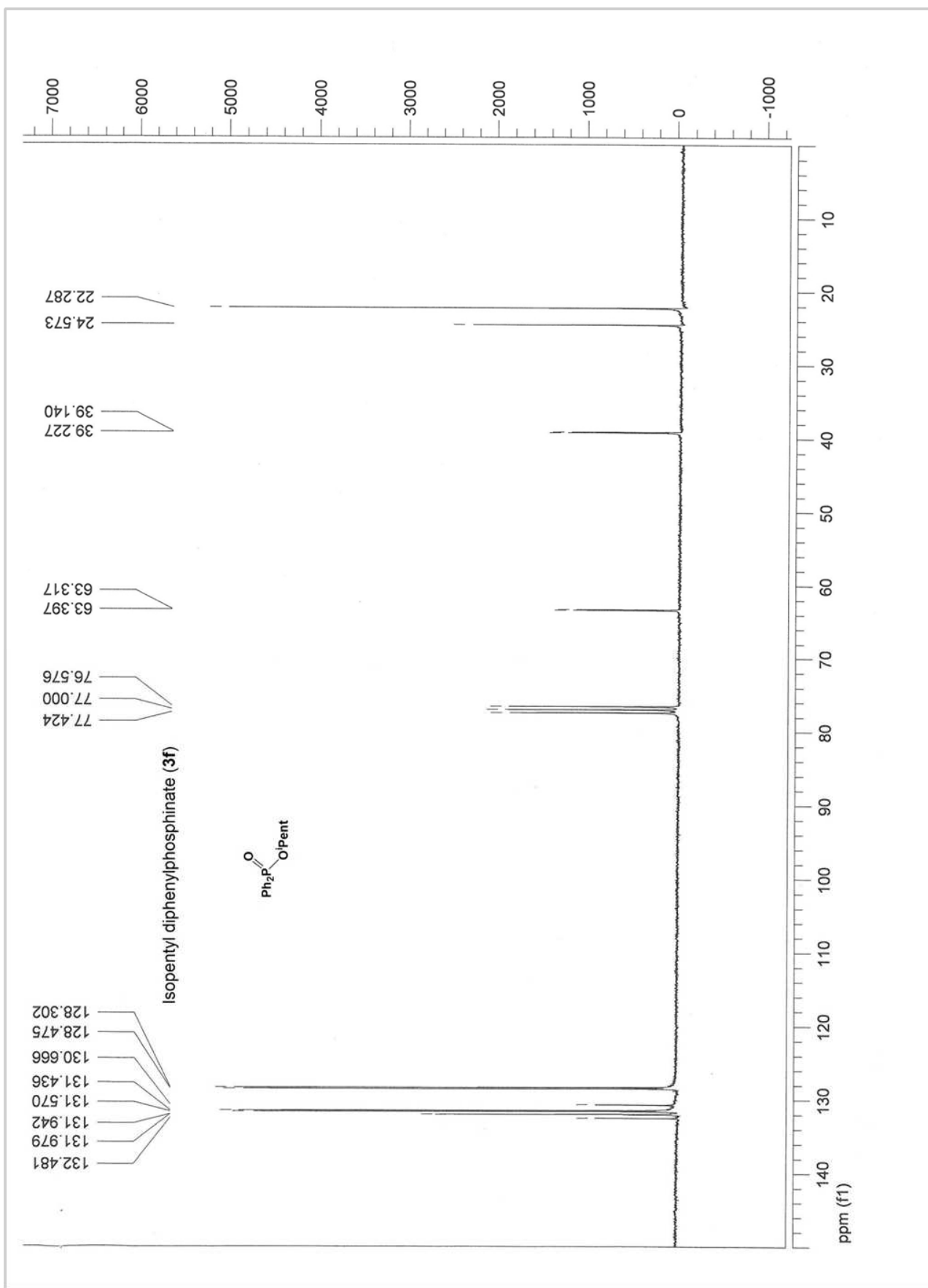


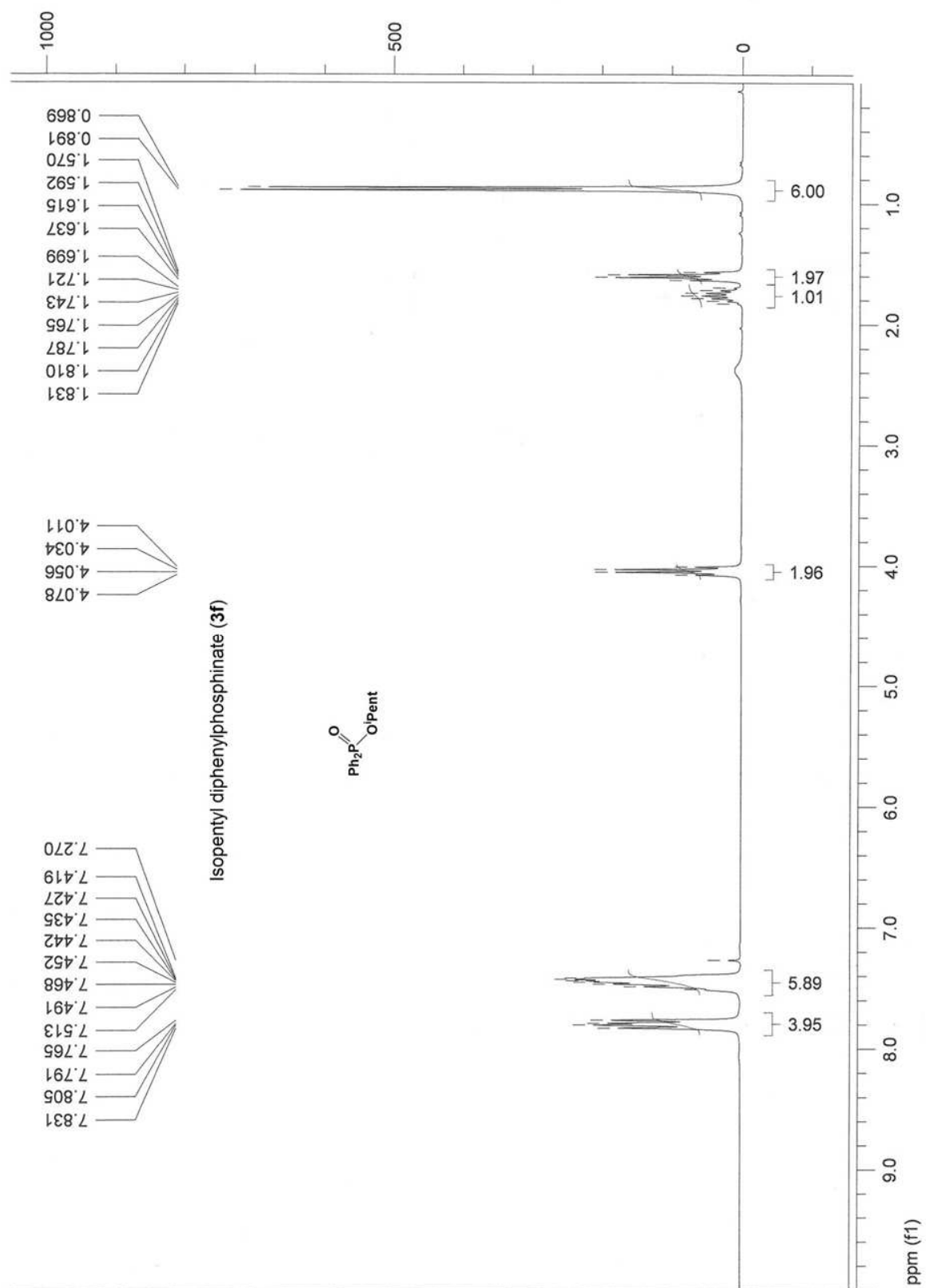


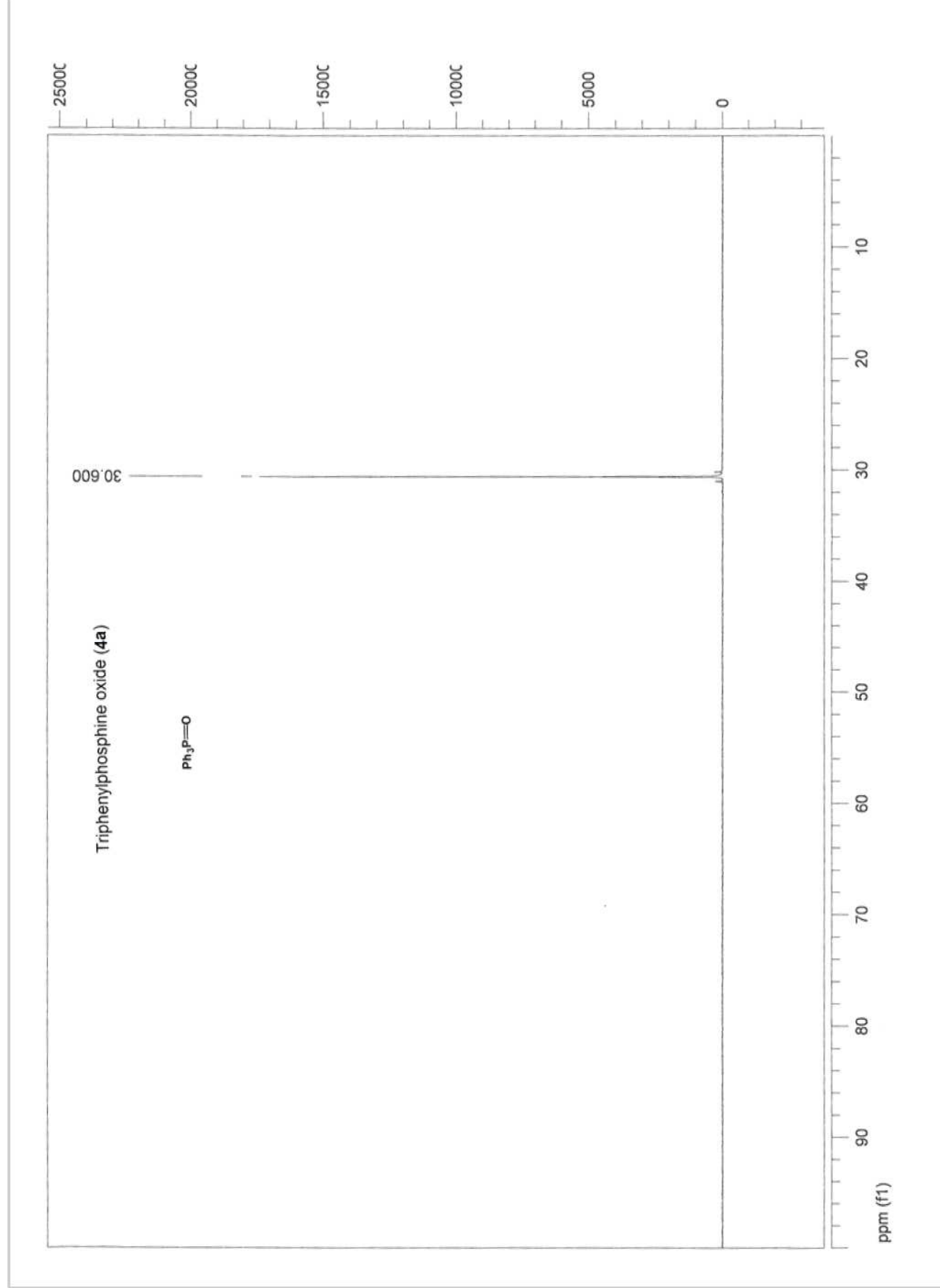


Isopentyl diphenylphosphinate (3f)

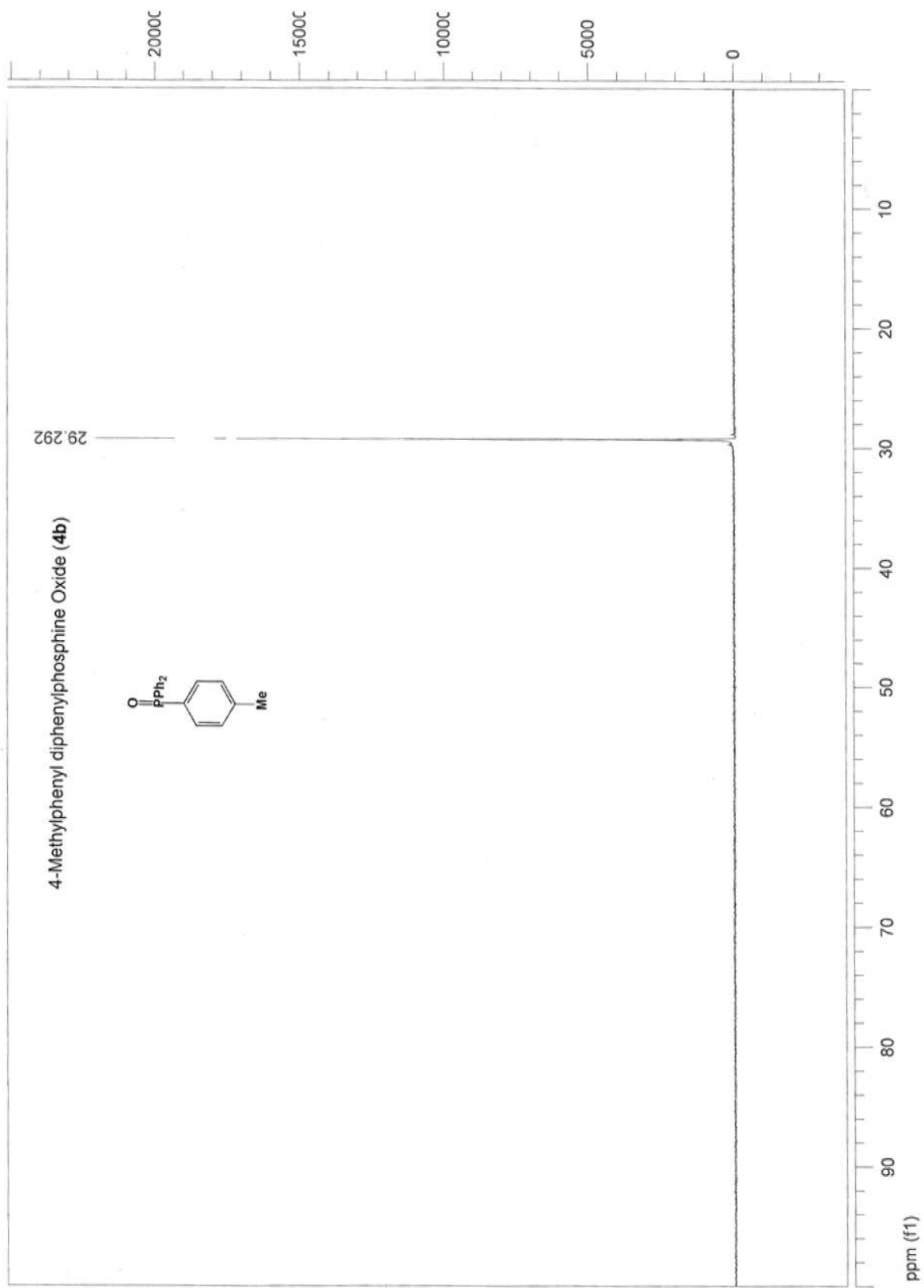
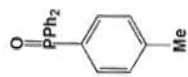


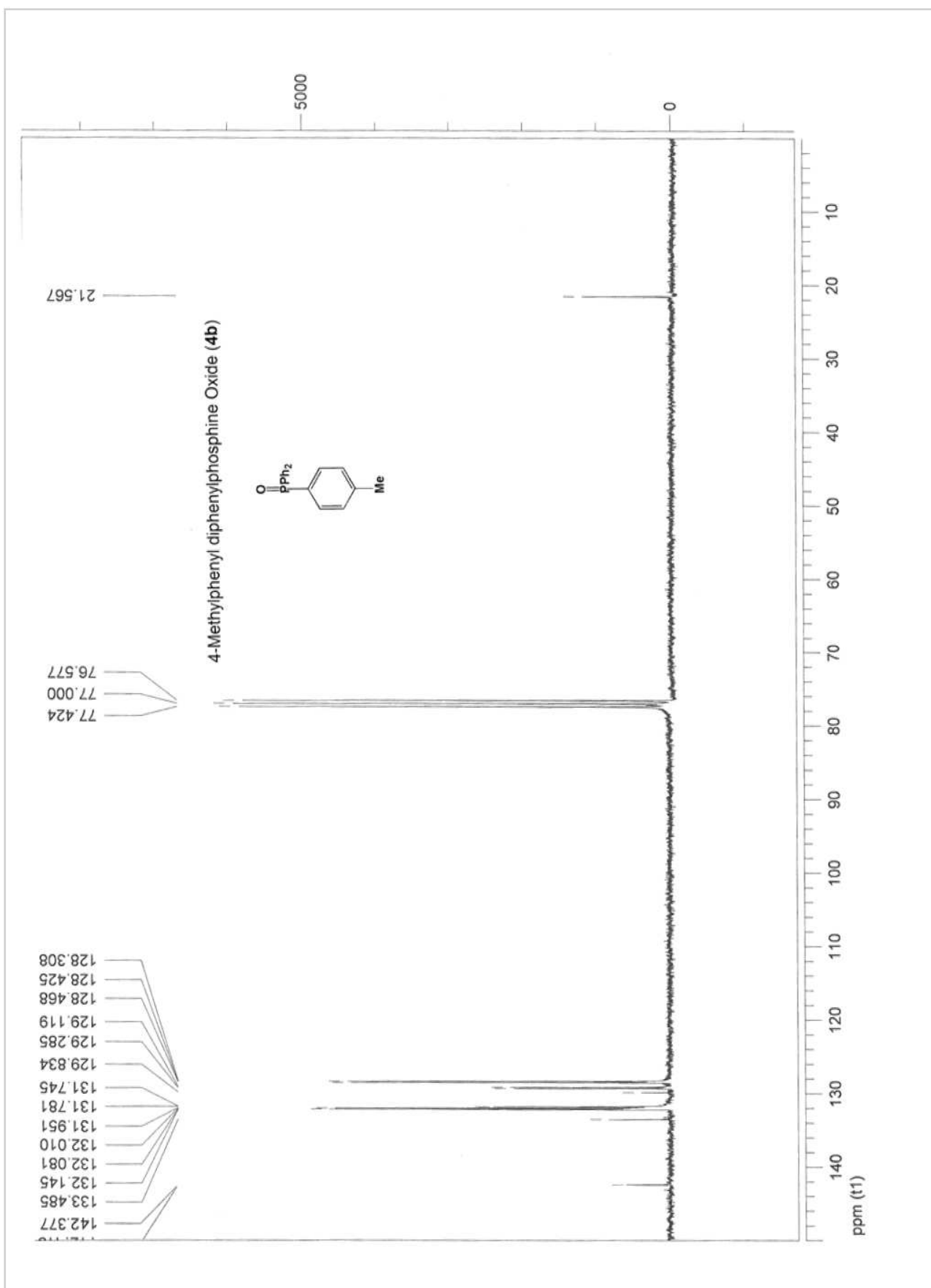


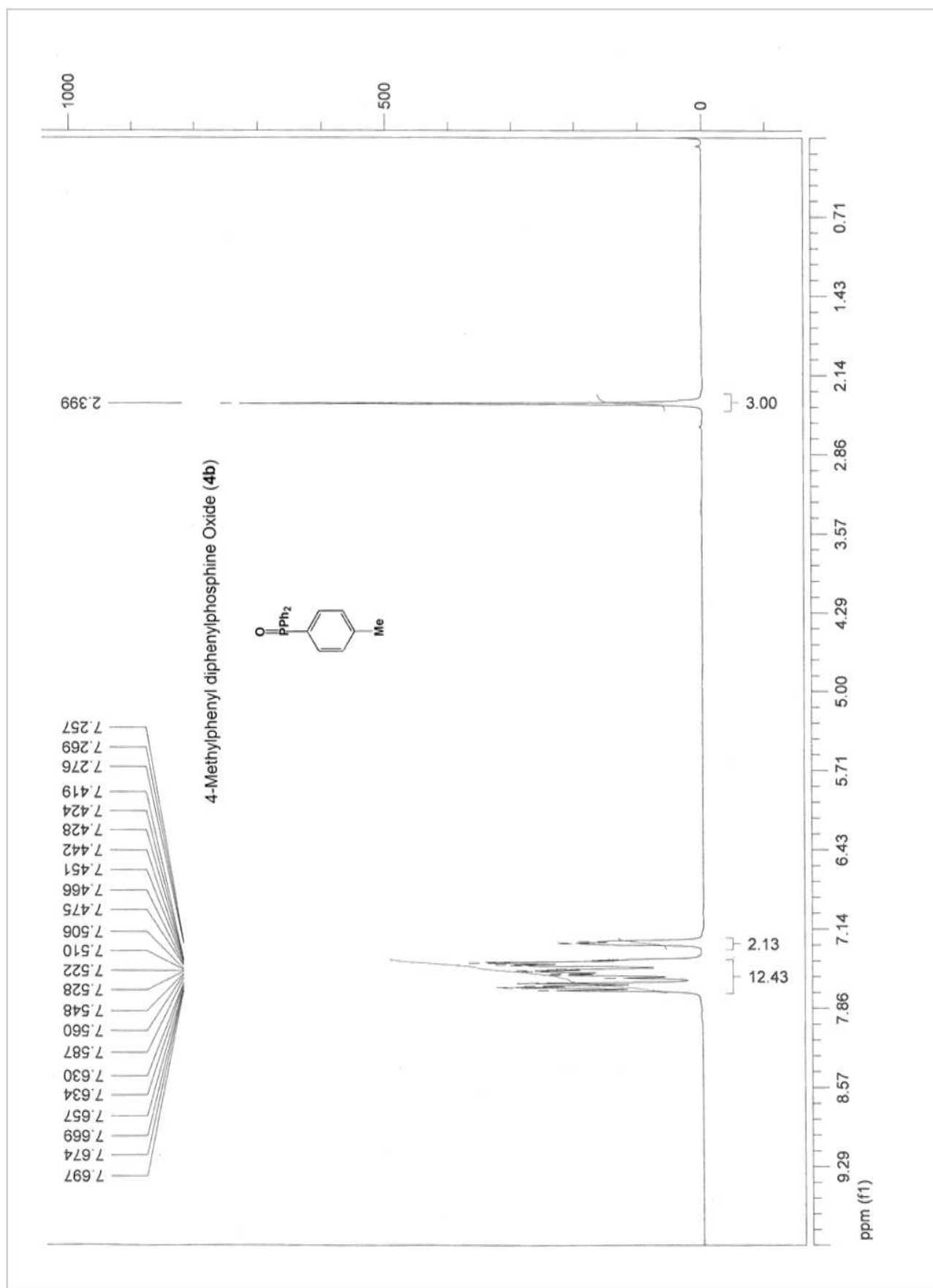




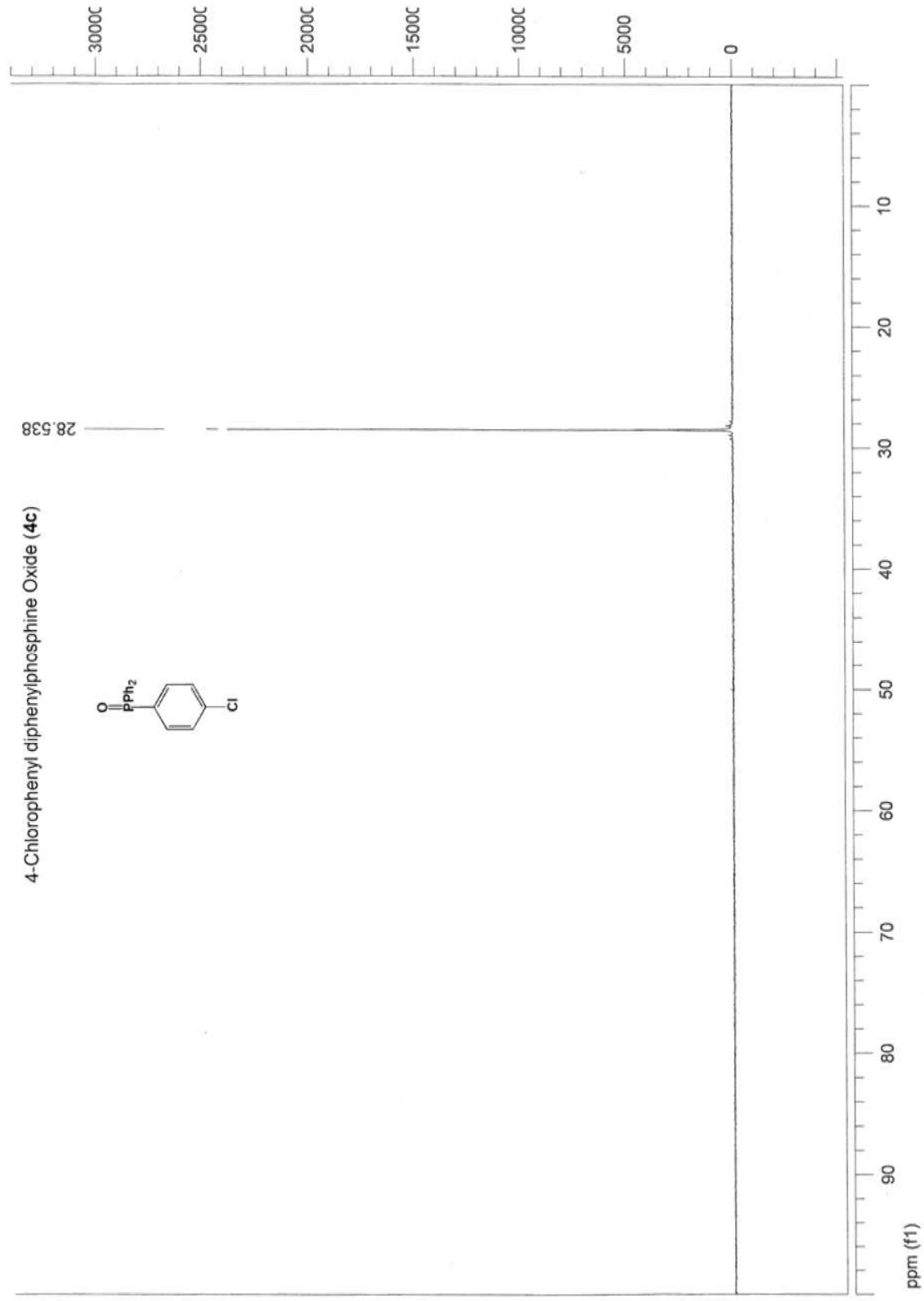
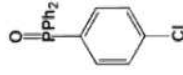
4-Methylphenyl diphenylphosphine Oxide (**4b**)

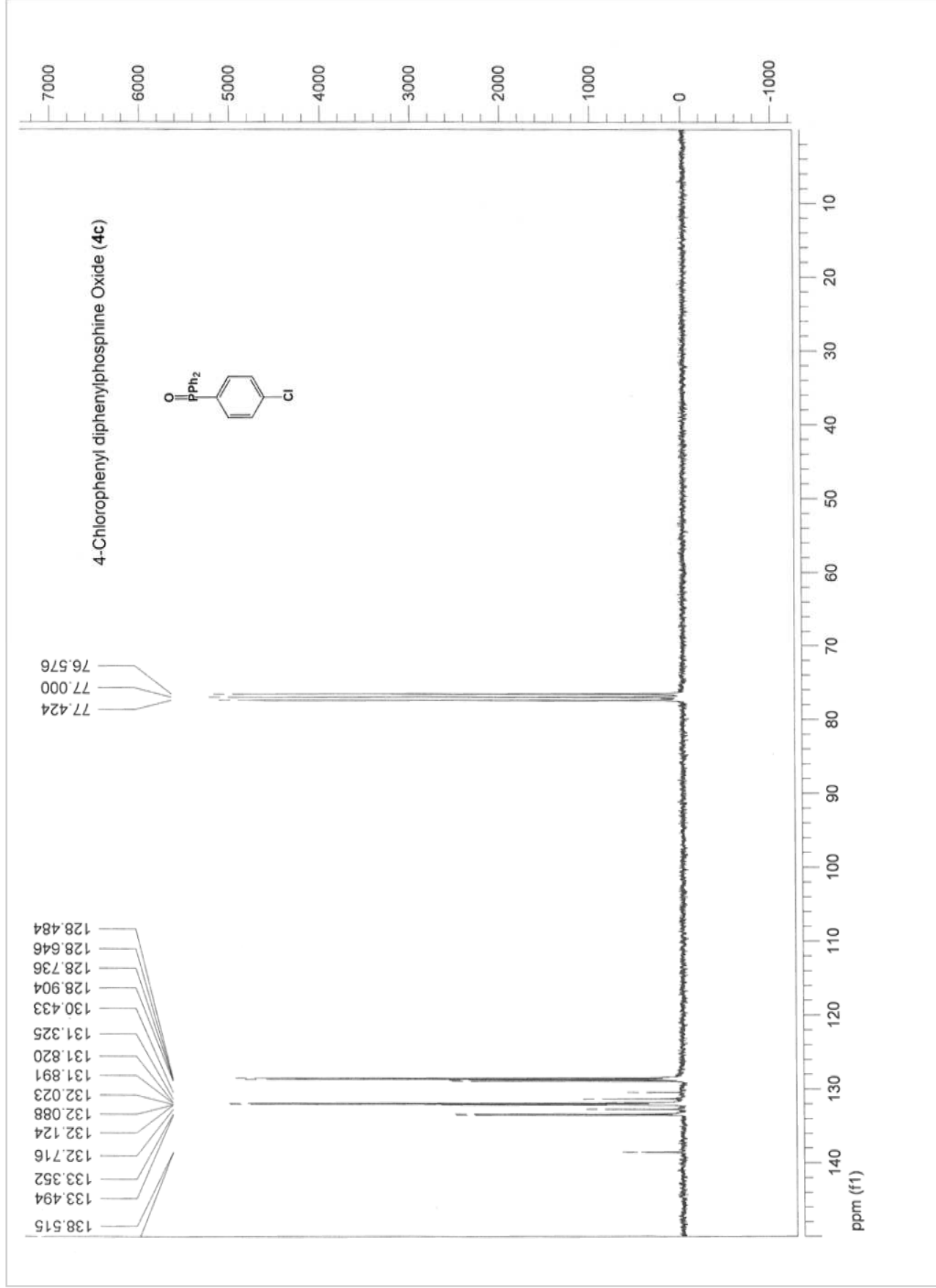




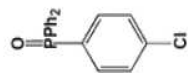


4-Chlorophenyl diphenylphosphine Oxide (**4c**)

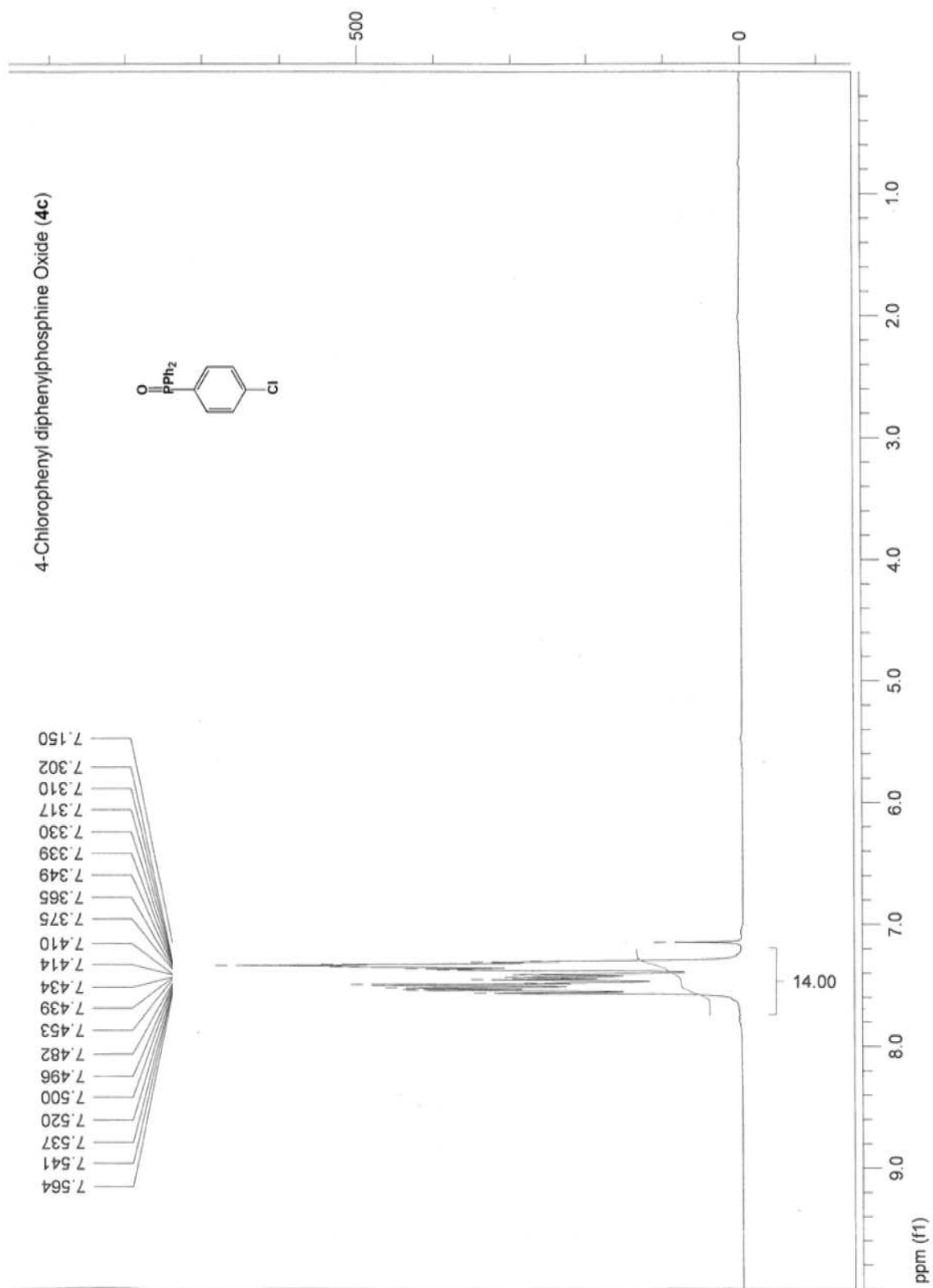




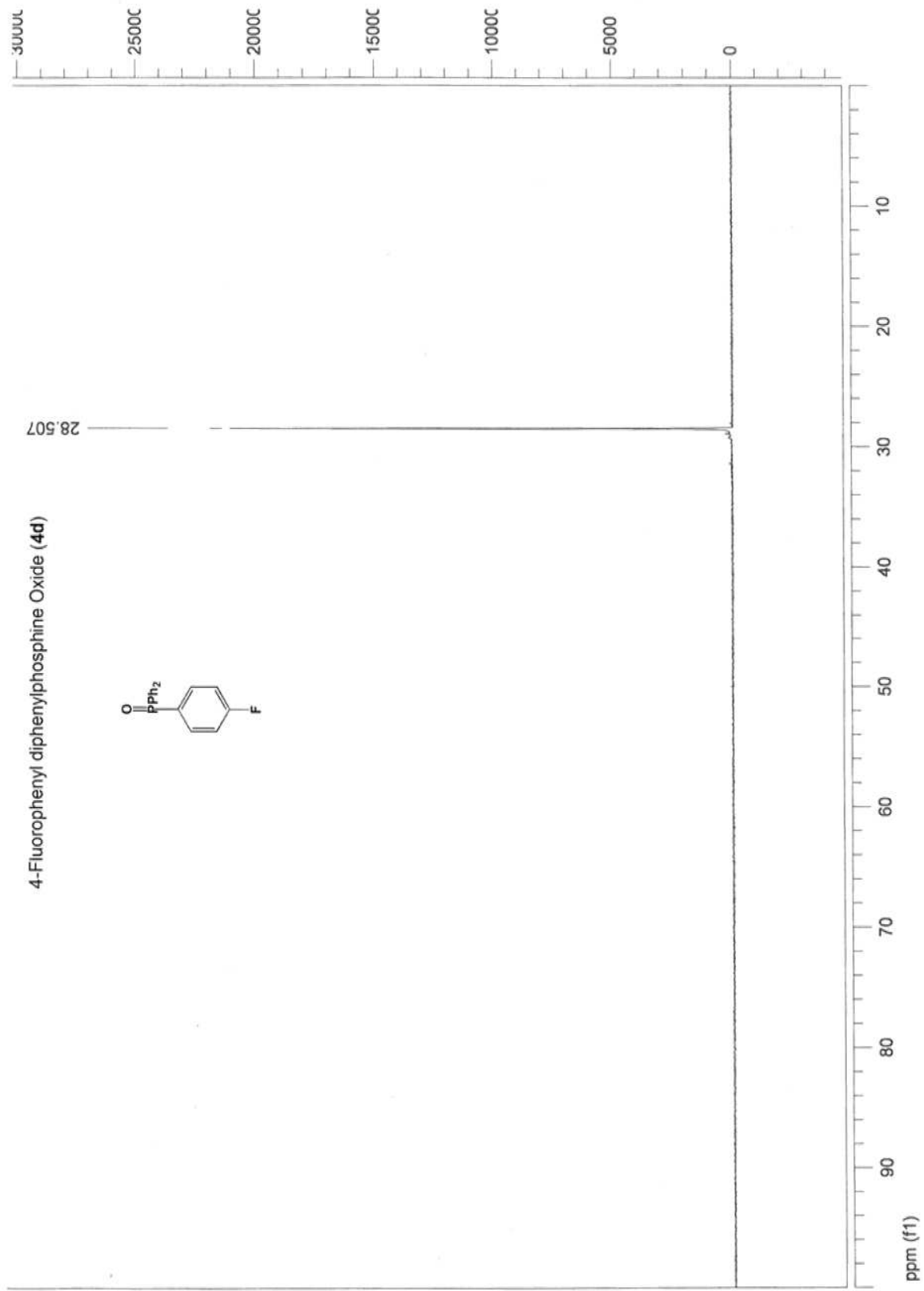
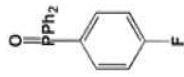
4-Chlorophenyl diphenylphosphine Oxide (4c)



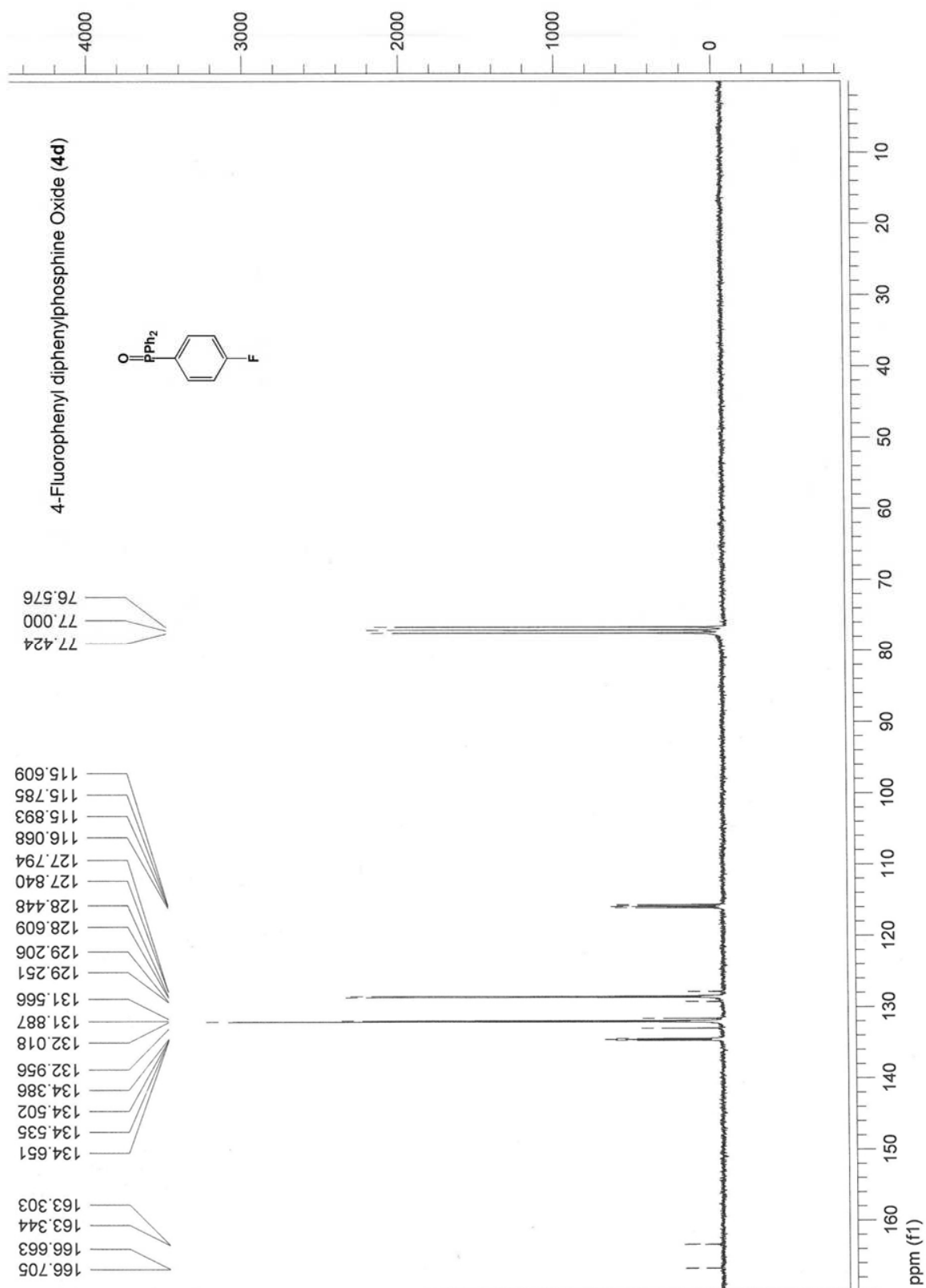
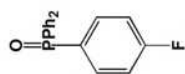
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7.330
7.317
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7.302
7.150



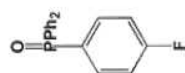
4-Fluorophenyl diphenylphosphine Oxide (**4d**)



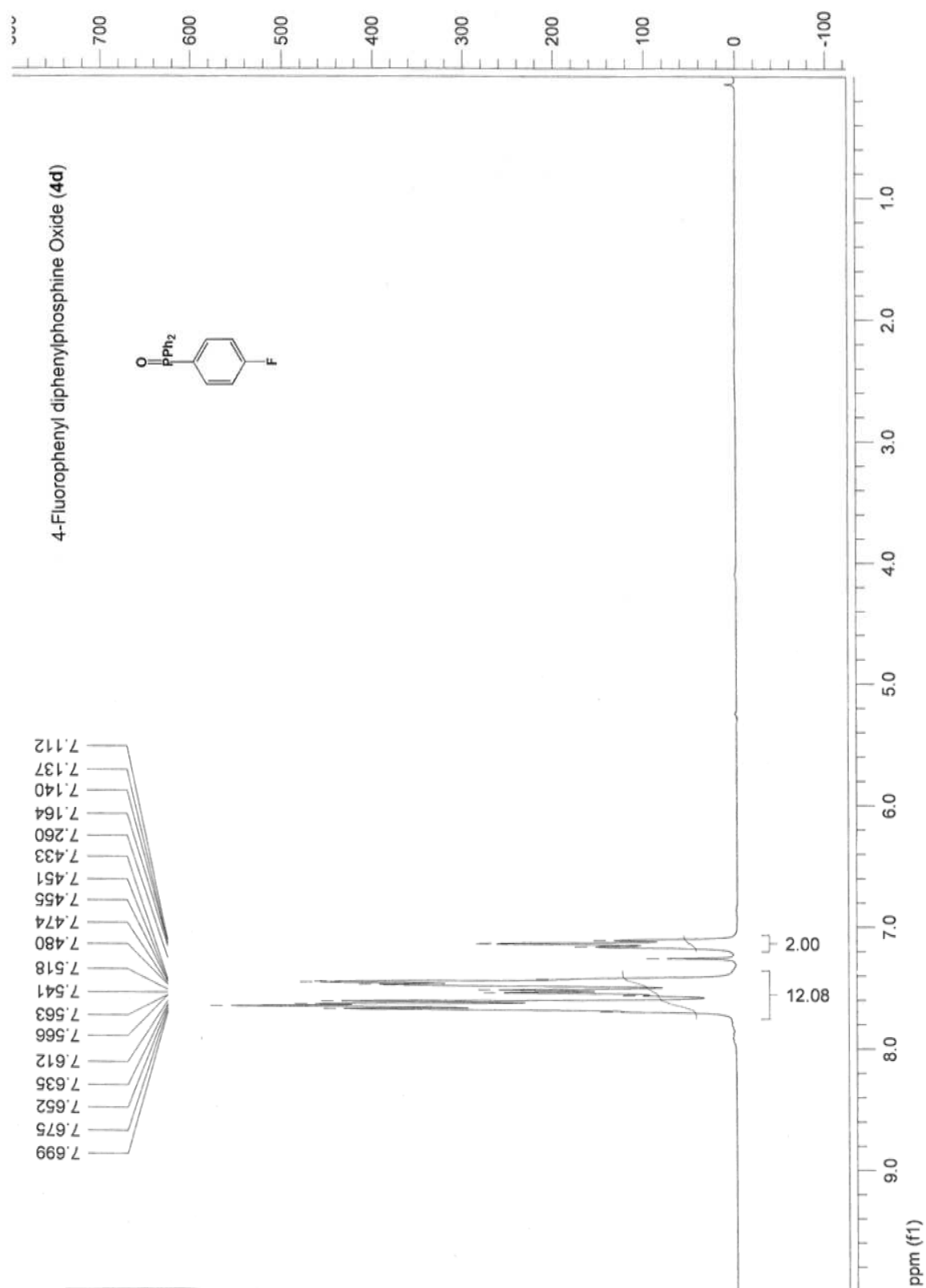
4-Fluorophenyl diphenylphosphine Oxide (**4d**)



4-Fluorophenyl diphenylphosphine Oxide (4d)



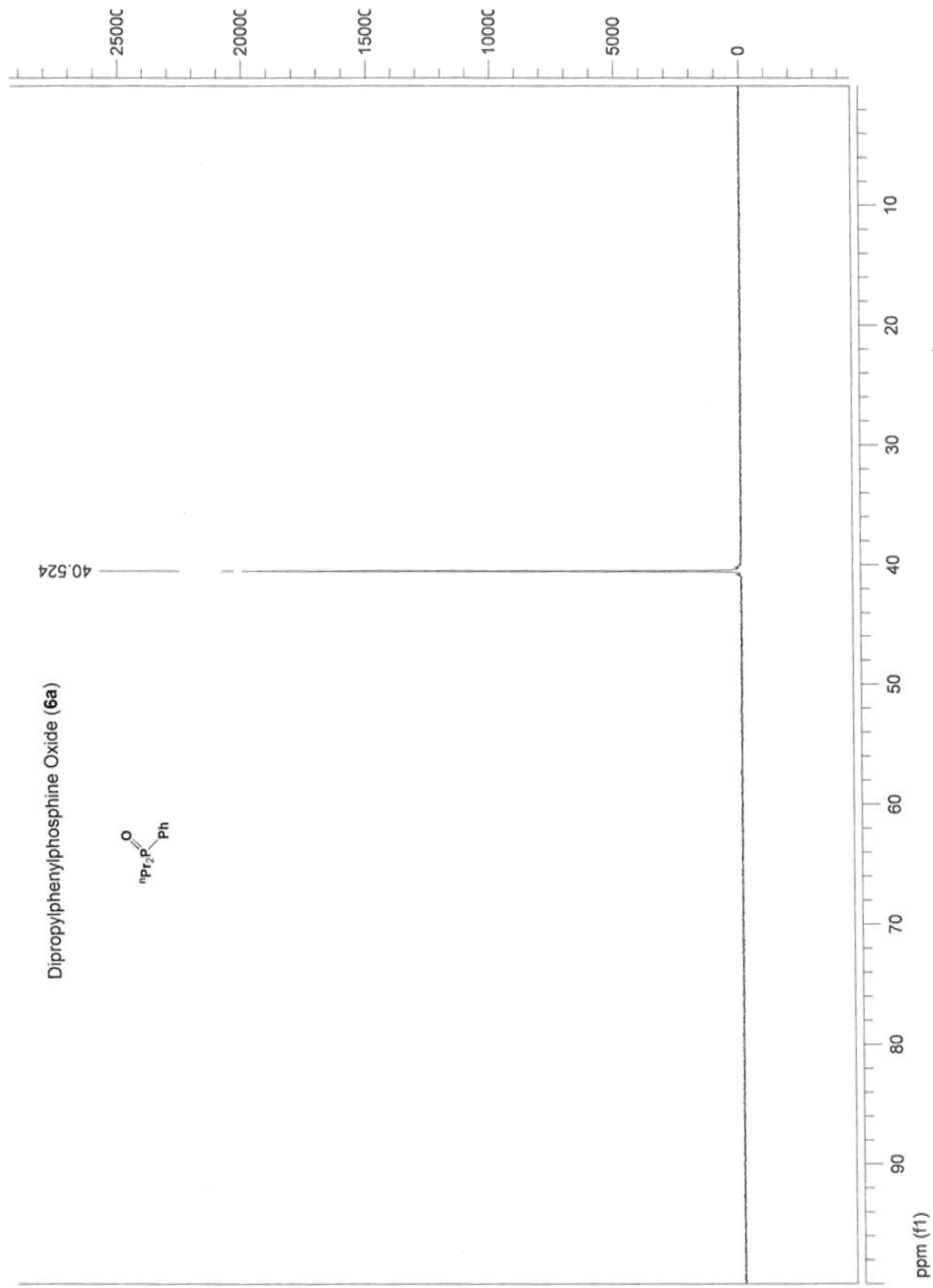
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7.433
7.260
7.164
7.140
7.137
7.112

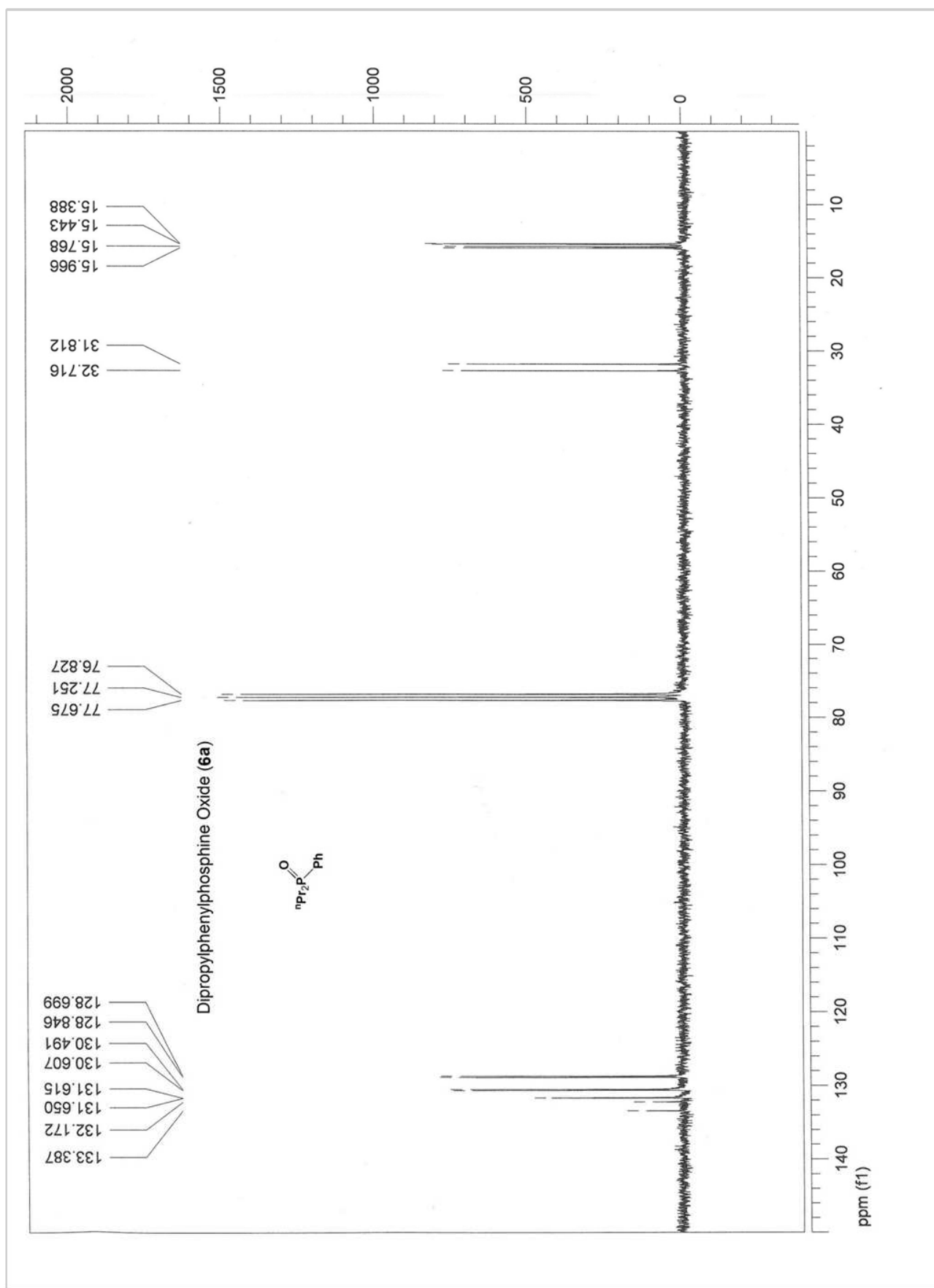


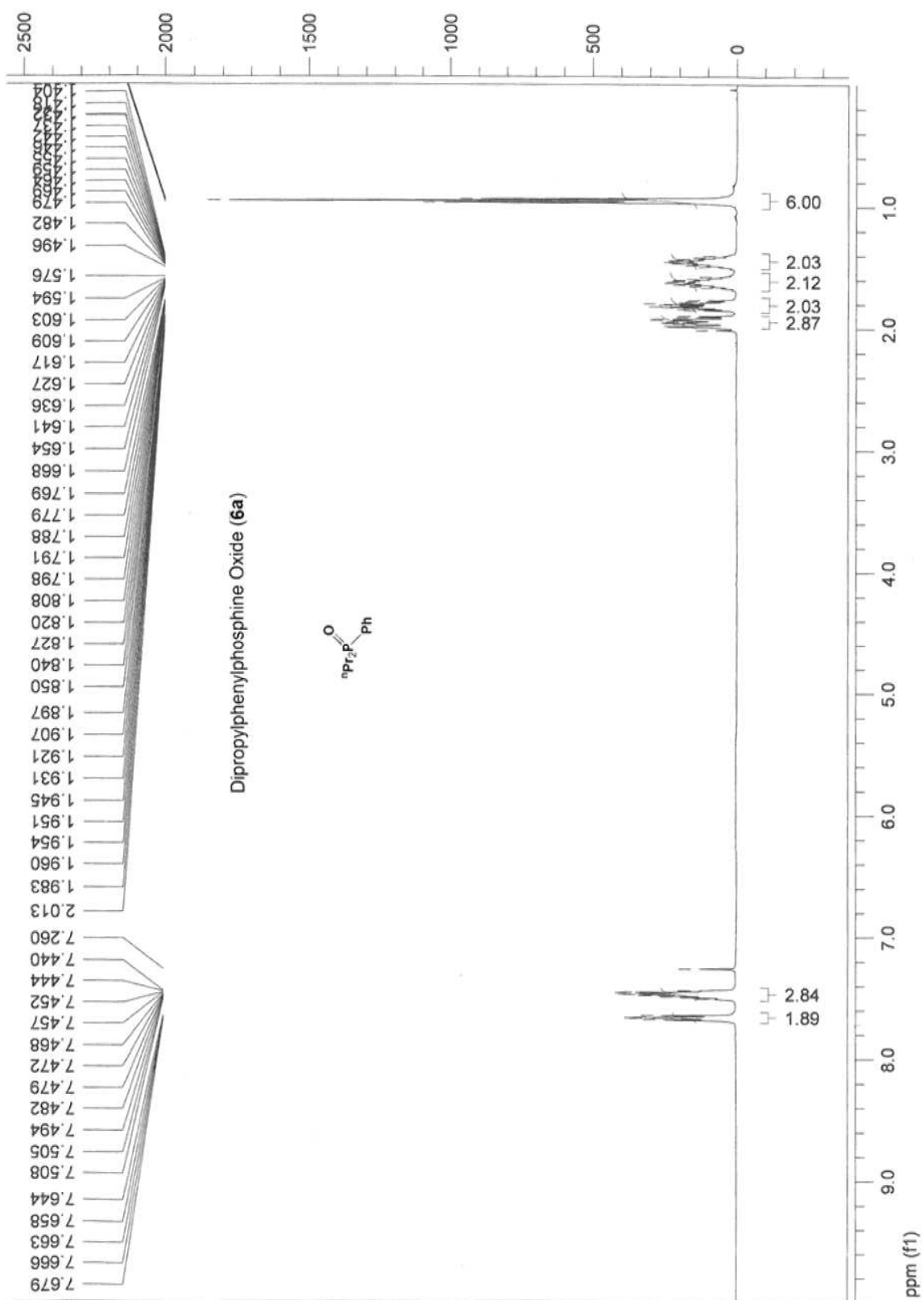
Dipropylphenylphosphine Oxide (6a)



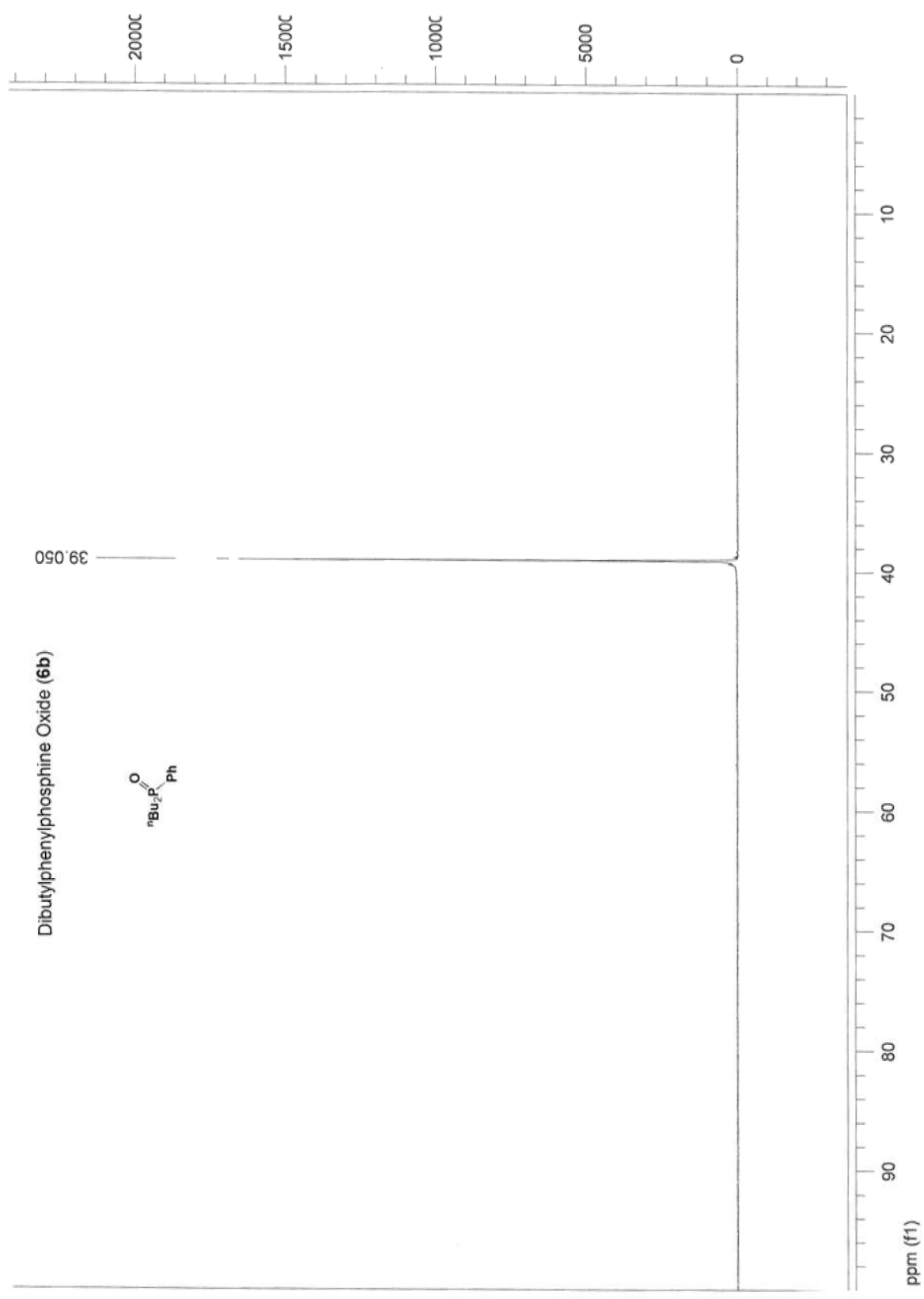
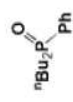
40.524

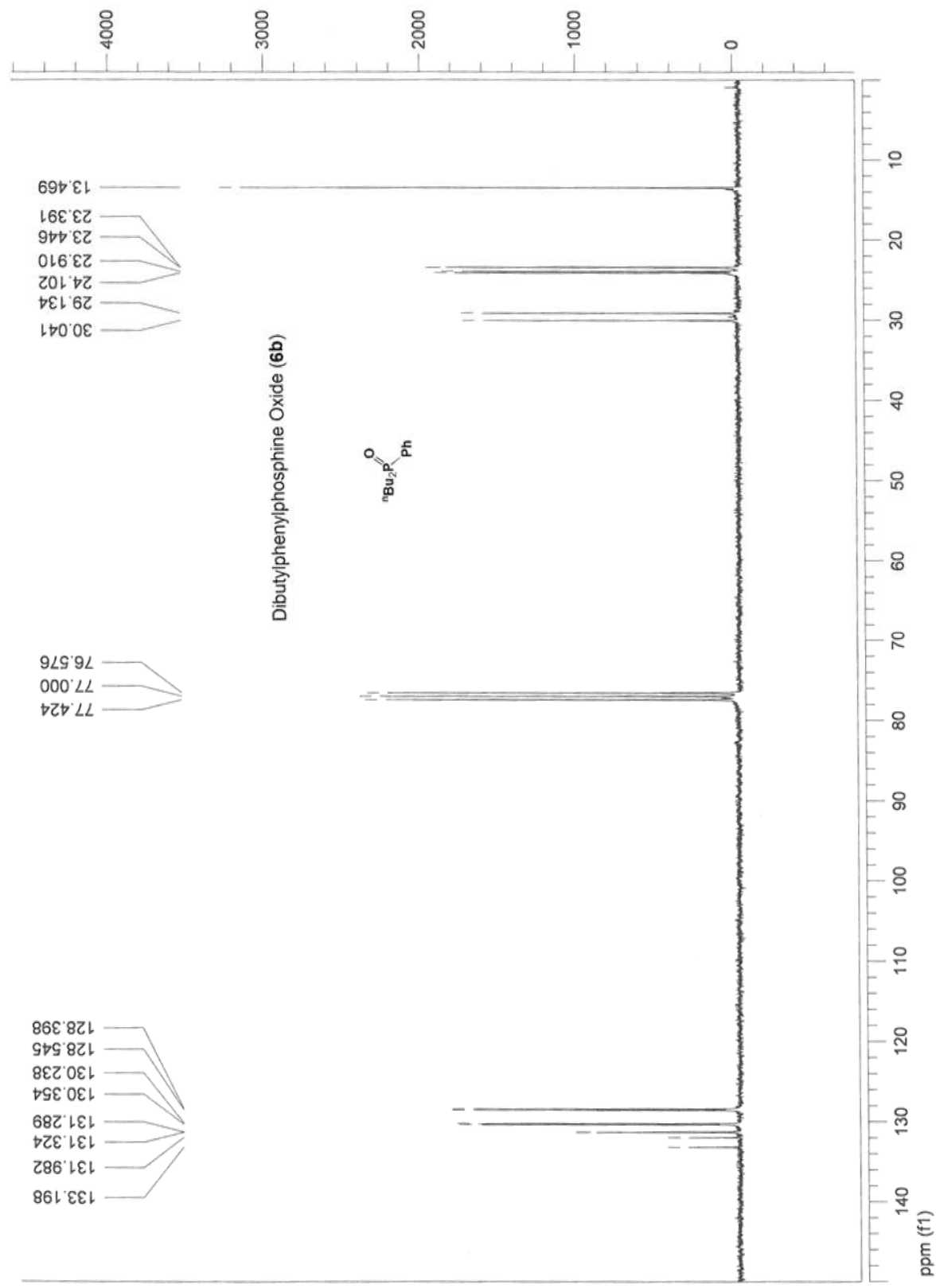


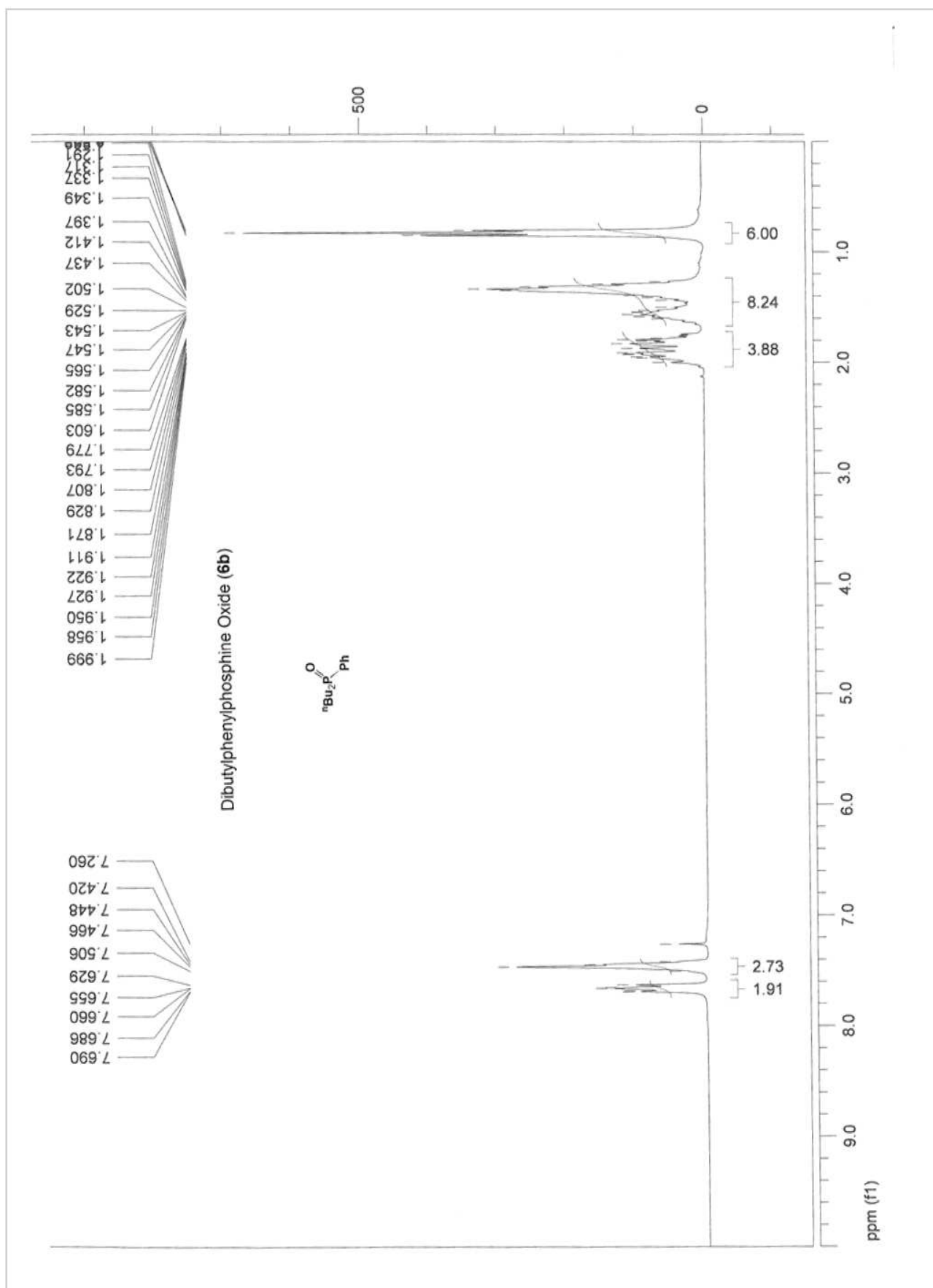




Dibutylphenylphosphine Oxide (**6b**)







Dibenzylphenylphosphine Oxide (**6c**)

