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Ultrasound-promoted synthesis of Bi, Tri and Tetrapodal Polyhydroquinolines, 1,4-Dihydropyridines and their pyridines

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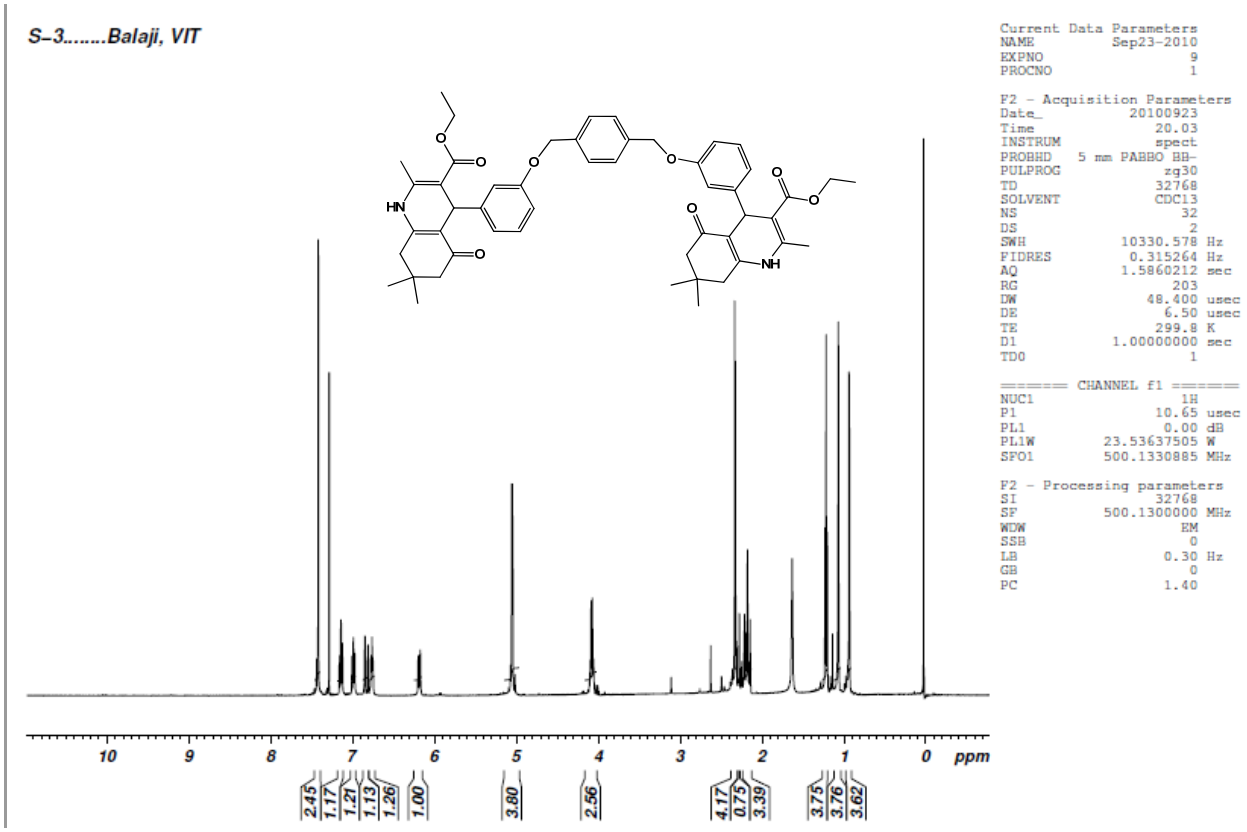
Supporting Information

^{1}H NMR of 3.3 Diethyl 4, 4′-(3, 3′-(1,4-phenylenebis(methylene)bis(oxy)bis(3,1-phenylene))bis(2,7,7-trimethyl -5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate) **[9]**



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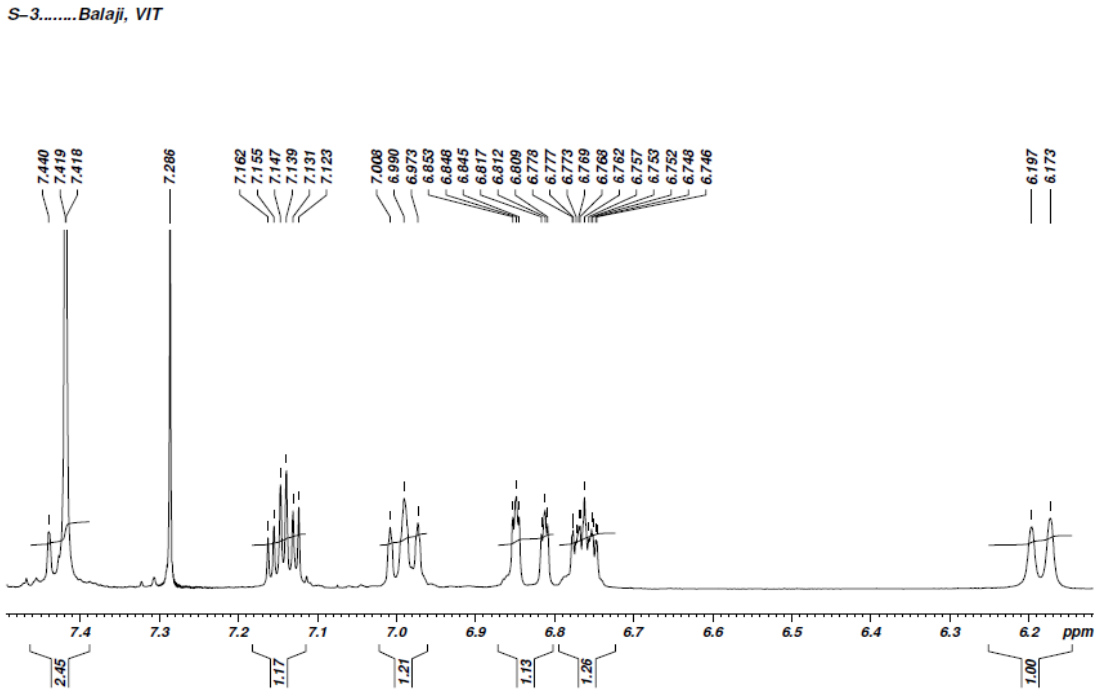
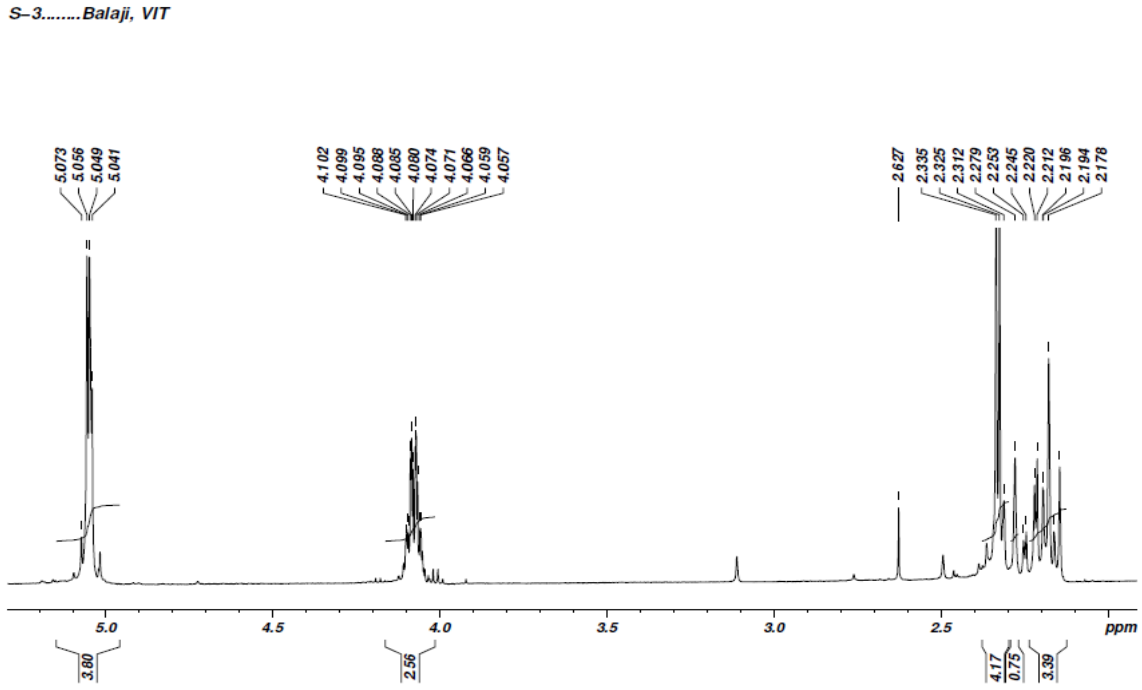
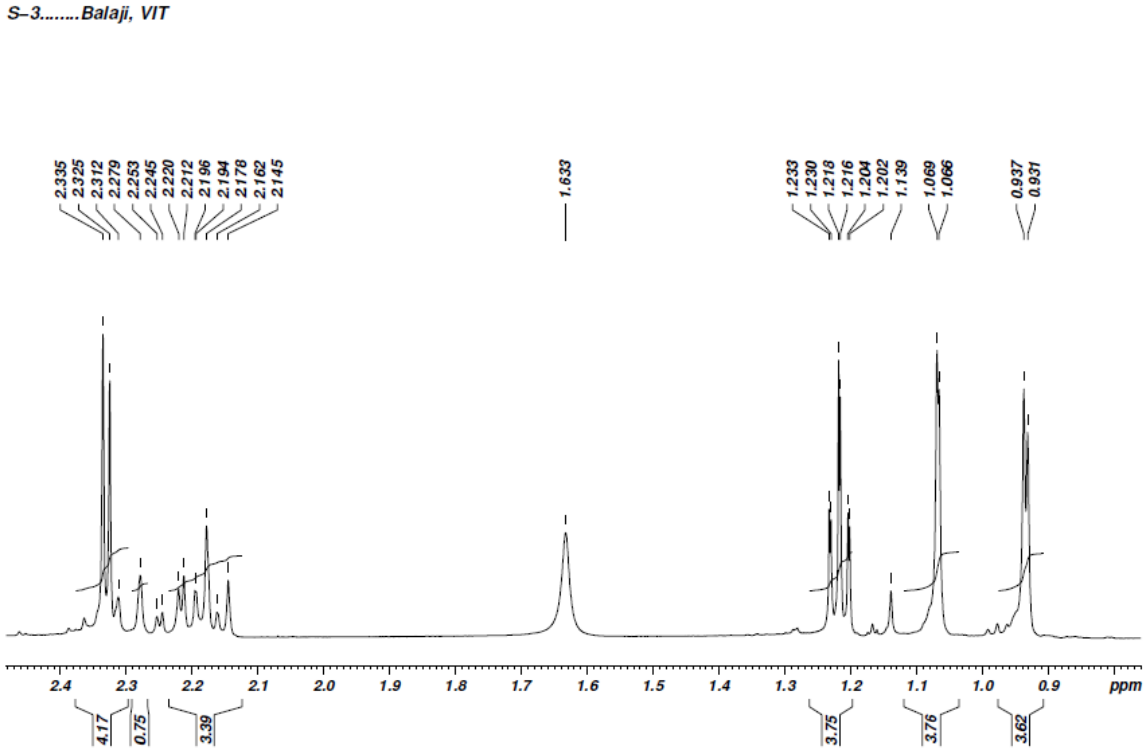
^{1}H NMR (Enlarged) of 3.3 Diethyl 4, 4′-(3, 3′-(1,4-phenylenebis(methylene)bis(oxy)bis(3,1-phenylene))bis(2,7,7-trimethyl -5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate) **[9]**



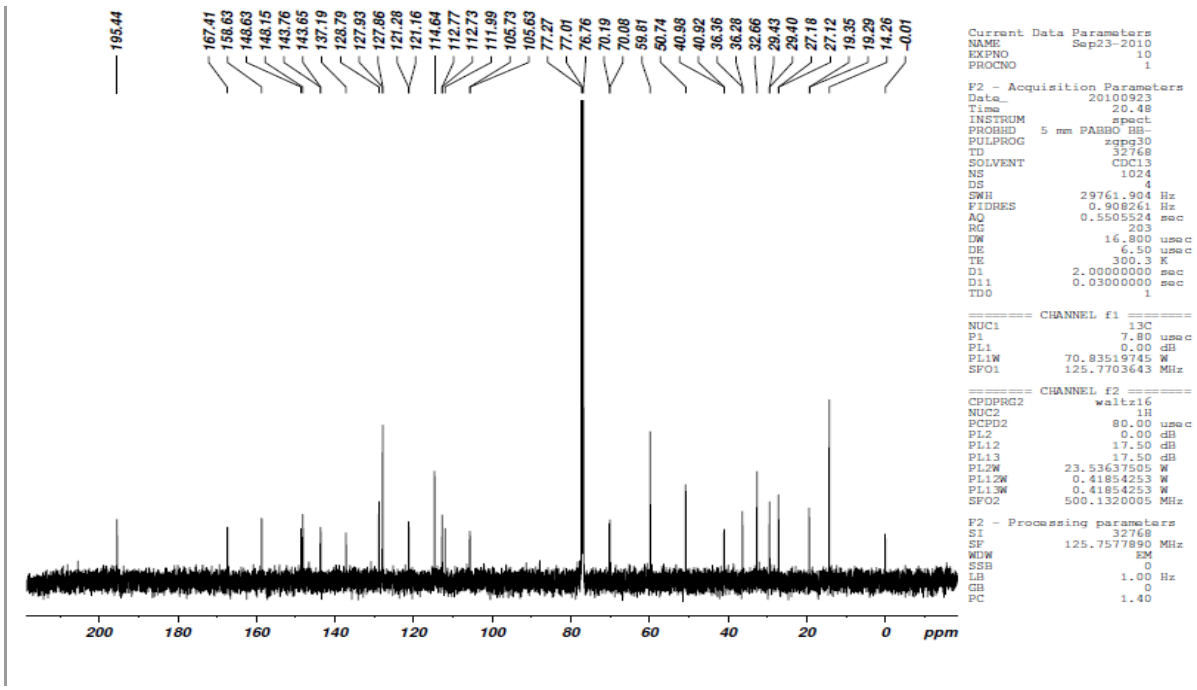
^{1}H NMR (Enlarged) of 3.3 Diethyl 4, 4′-(3, 3′-(1,4-phenylenebis(methylene)bis(oxy)bis(3,1-phenylene))bis(2,7,7-trimethyl -5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate) **[9]**



^{1}H NMR (Enlarged) of 3.3 Diethyl 4, 4′-(3, 3′-(1,4-phenylenebis(methylene)bis(oxy)bis(3,1-phenylene))bis(2,7,7-trimethyl -5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate) **[9]**



^{13}C NMR of 3.3 Diethyl 4, 4’-(3, 3’-(1,4-phenylenebis(methylene)bis(oxy)bis(3,1-phenylene))bis(2,7,7-trimethyl -5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate) **[9]**



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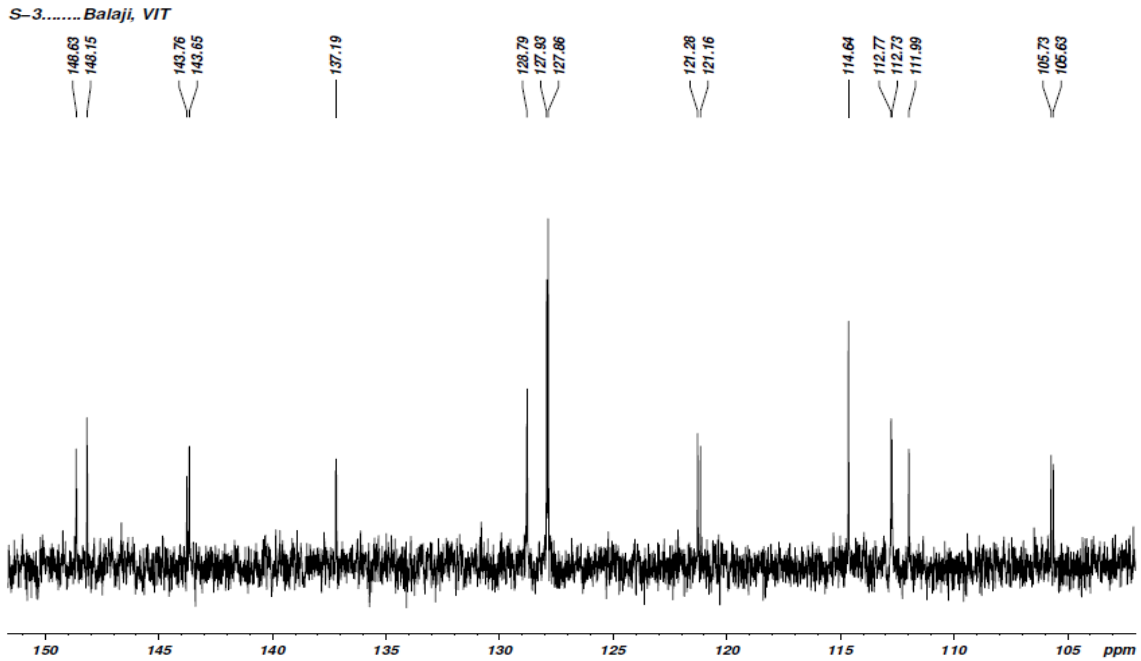
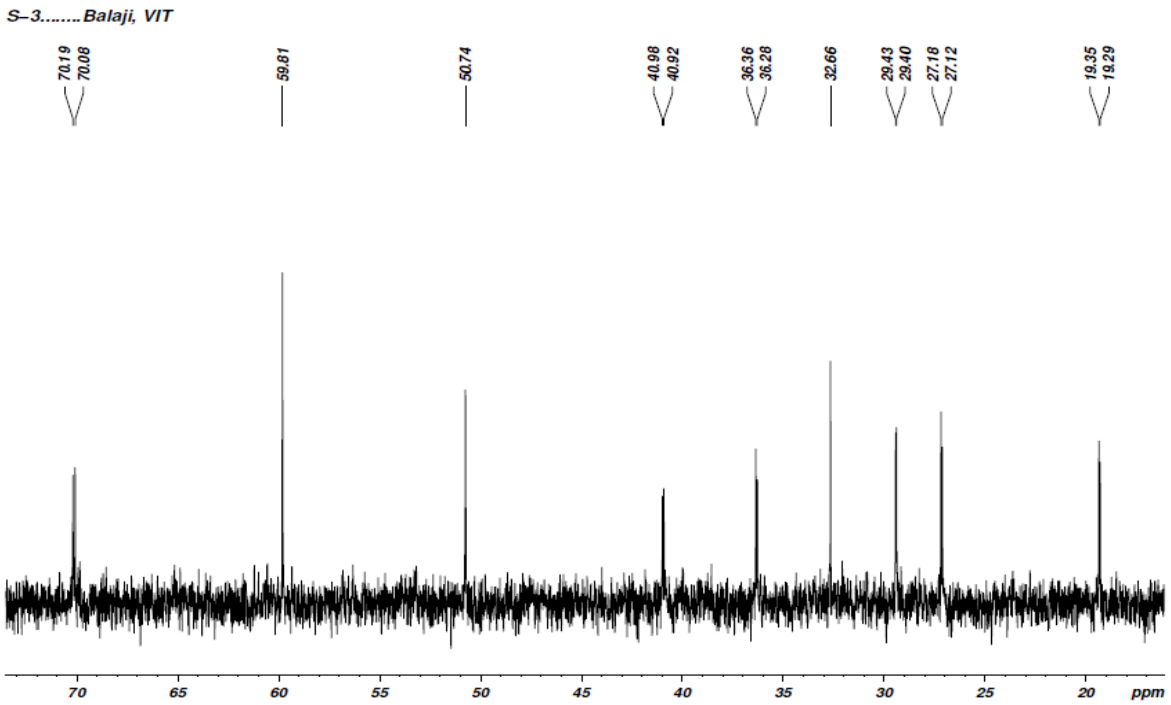
^{13}C NMR (Enlarged) of 3.3 Diethyl 4, 4'-(3, 3'-(1,4-phenylenebis(methylene)bis(oxy)bis(3,1-phenylene))bis(2,7,7-trimethyl -5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate) **[9]**



^{13}C NMR (Enlarged) of 3.3 Diethyl 4, 4'-(3, 3'-(1,4-phenylenebis(methylene)bis(oxy)bis(3,1-phenylene))bis(2,7,7-trimethyl -5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate) **[9]**



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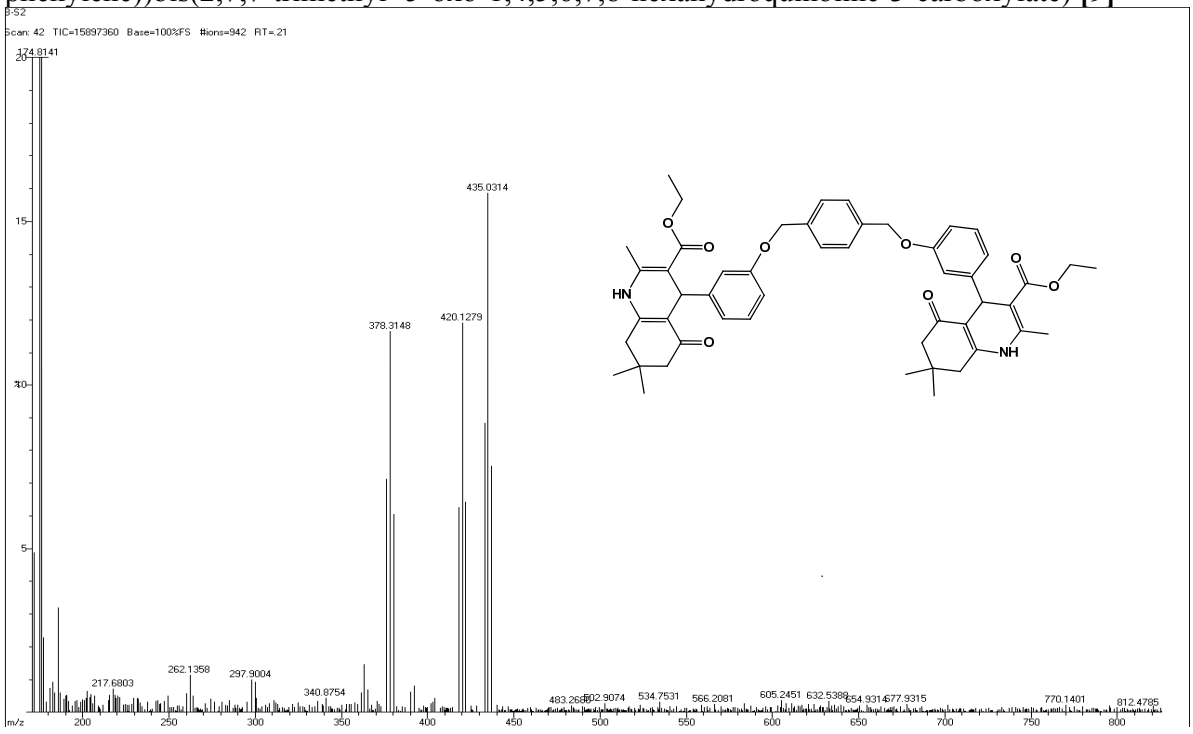
HR-MS of 3.3 Diethyl 4, 4'-(3, 3'-(1,4-phenylenebis(methylene)bis(oxy)bis(3,1-phenylene))bis(2,7,7-trimethyl -5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate) **[9]**



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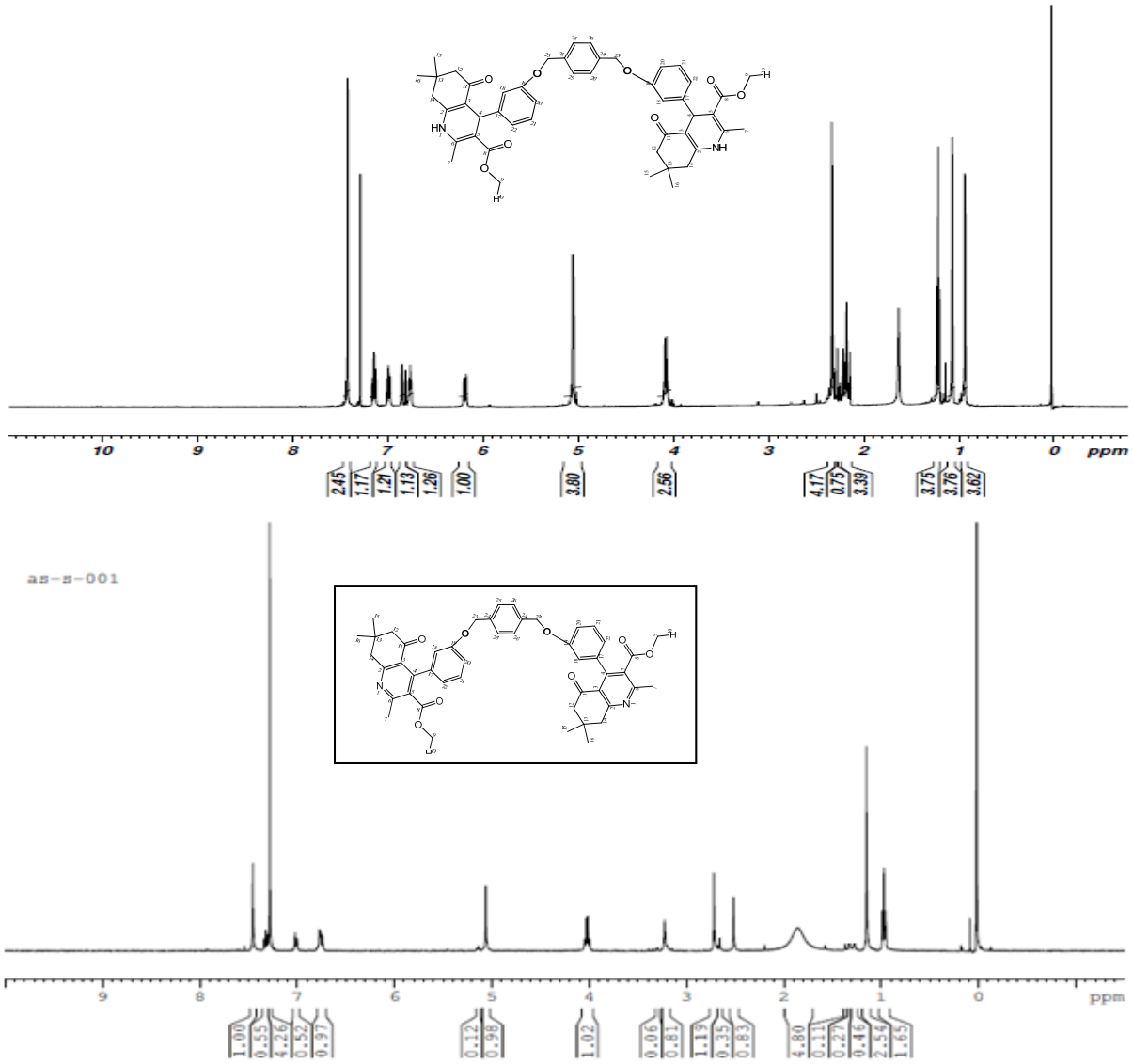
Comparative ^{1}H-NMR Spectra of Diethyl 4,4'-(((1,4-phenylene*bis*(methylene))*bis*(oxy))*bis*(3,1-phenylene))*bis*(2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate) **(9)** and Diethyl 4,4'-(((1,4-phenylene*bis*(methylene))*bis*(oxy))*bis*(3,1-phenylene))*bis*(2,7,7-trimethyl-5-oxo-5,6,7,8-tetrahydroquinoline-3-carboxylate) **(28).**



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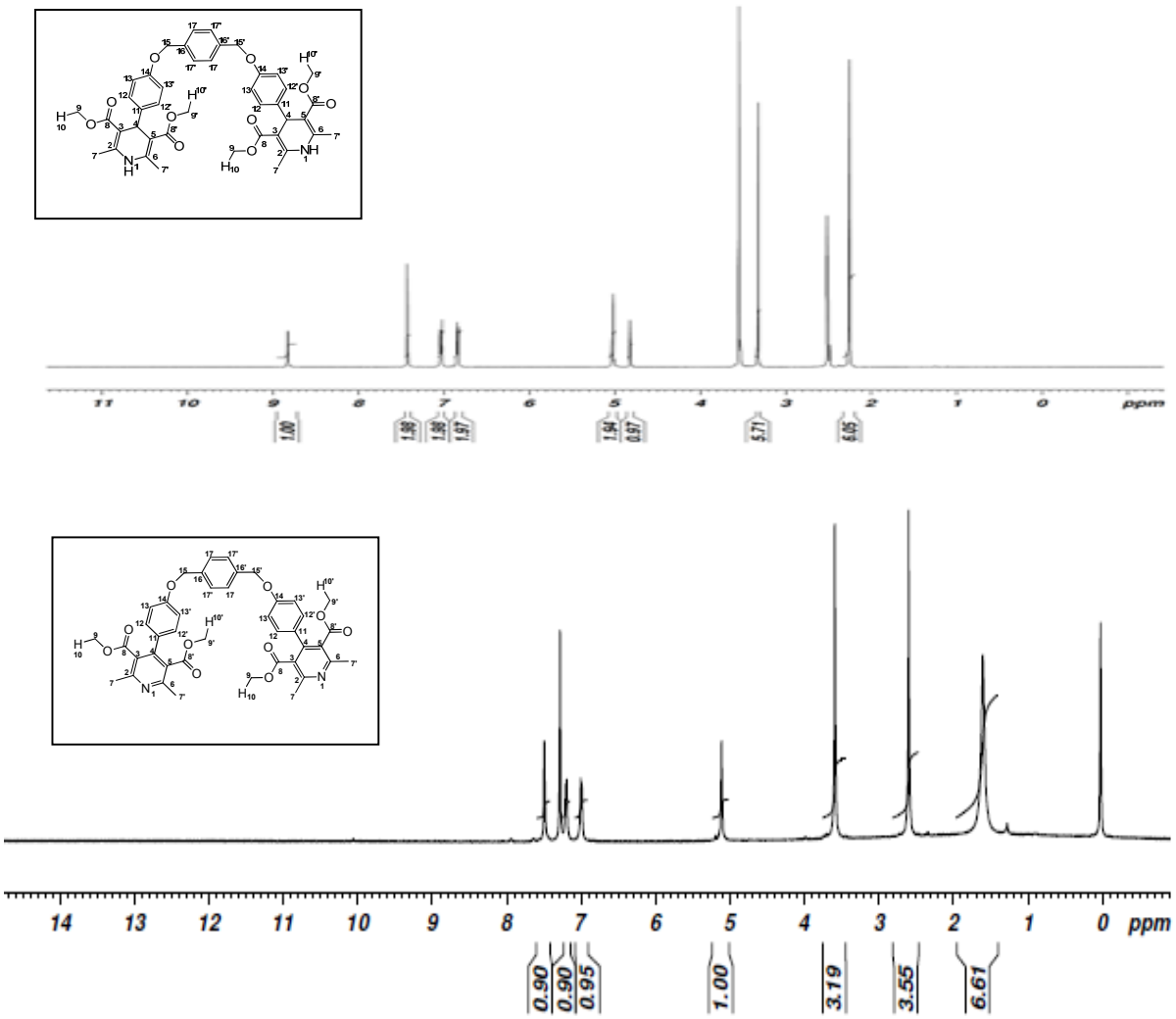
Comparative ^{1}H-NMR spectra of Tetramethyl 4,4'-(((1,4-phenylene*bis*(methylene))*bis*(oxy))*bis*(4,1-phenylene))*bis*(2,6-dimethyl-1,4-dihydropyridine-3,5-dicarboxylate) **(15)** and Tetramethyl 4,4'-(((1,4-phenylene*bis*(methylene))*bis*(oxy)) *bis*(4,1-phenylene))*bis*(2,6-dimethylpyridine-3,5-dicarboxylate) **(33)**.



Though the ^{1}H-NMR spectrum of **33** is similar to **15** the observation of slight difference in chemical shift values along with the absence of signals corresponds to the protons at -NH aswell as at C-4, 4' supports the conversion of **15** into Tetramethyl 4,4'-(((1,4-phenylene*bis*(methylene))*bis*(oxy))*bis*(4,1-phenylene))*bis*(2,6-dimethyl pyridine-3,5-dicarboxylate) **(33).**

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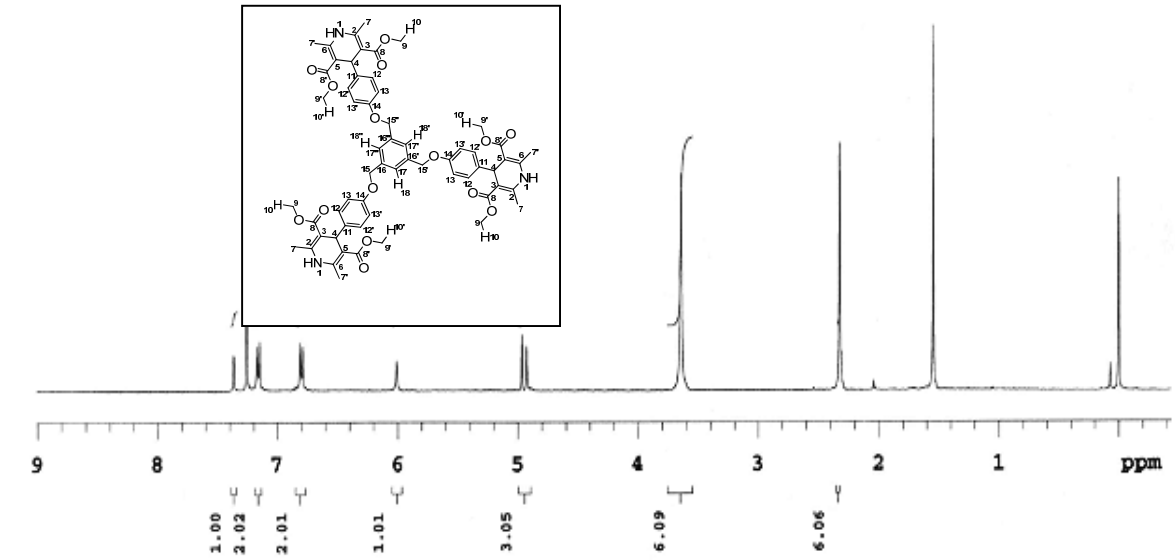
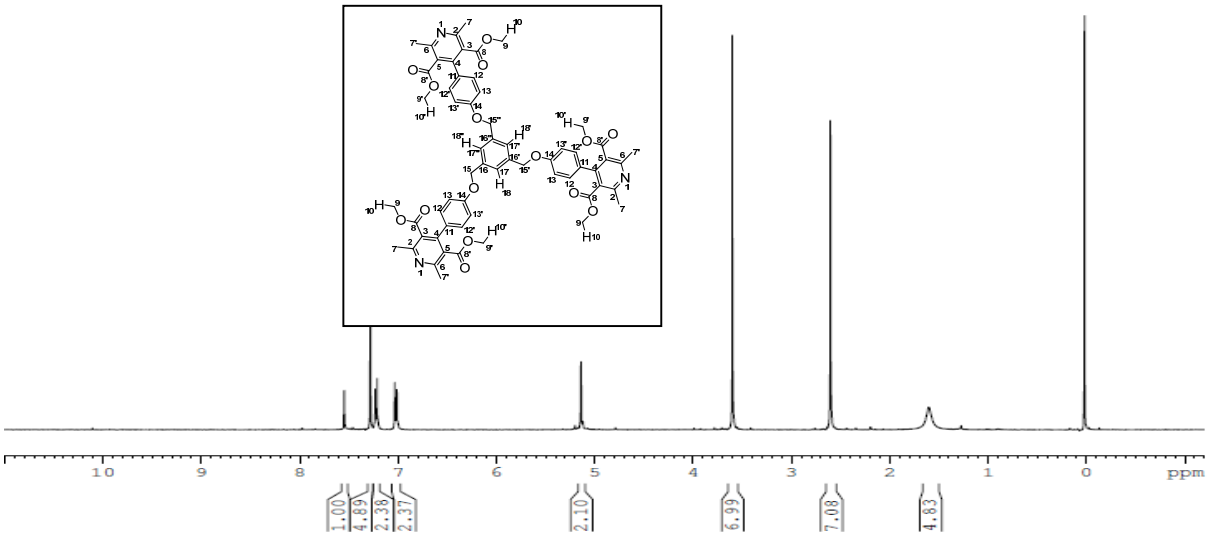
Comparative ^{1}H-NMR Spectra of Hexamethyl 4,4',4"-(((benzene-1,3,5-triyl *tris*(methylene))*tris*(oxy))*tris*(benzene-4,1-diyl))*tris*(2,6-dimethyl-1,4-dihydropyridine -3,5-dicarboxylate) **(24)** and Hexamethyl 4,4',4"-(((benzene-1,3,5-triyl*tris* (methylene))*tris*(oxy))*tris*(benzene-4,1-diyl))*tris*(2,6-dimethylpyridine-3,5-dicarboxylate) **(38).**





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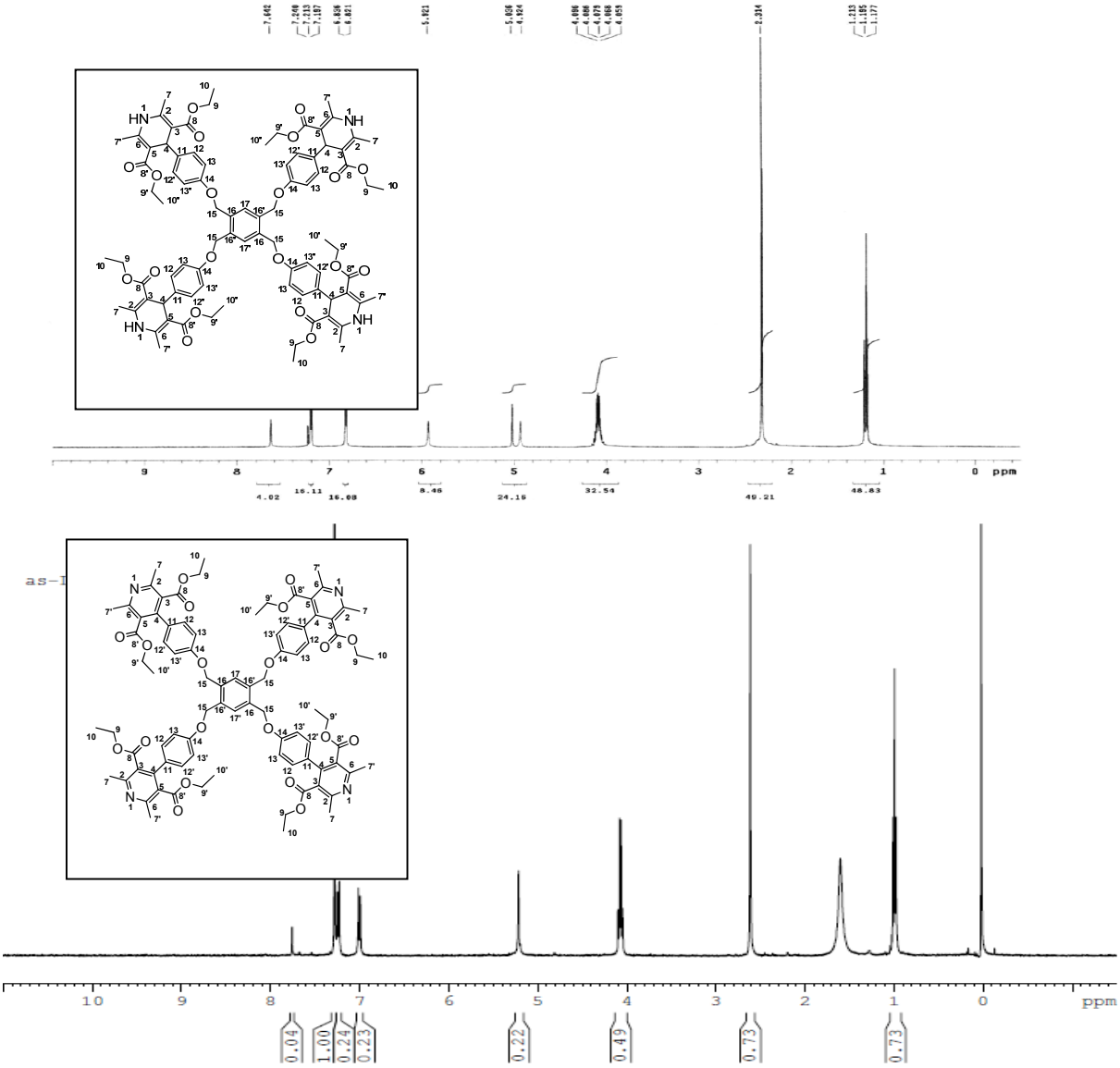
Comparative ^{1}H-NMR spectra of Octaethyl 4,4',4",4"'-(((benzene-1,2,4,5-*tetrayltetrakis*(methylene))*tetrakis*(oxy))*tetrakis*(benzene-4,1-diyl))*tetrakis*(2,6-di methyl-1,4-dihydropyridine-3,5-dicarboxylate) **(26)** and Octaethyl 4,4',4",4"'-(((benzene-1,2,4,5-*tetrayltetrakis*(methylene))*tetrakis*(oxy))*tetrakis*(benzene-4,1-diyl))*tetrakis*(2,6-dimethylpyridine-3,5-dicarboxylate) **(39).**



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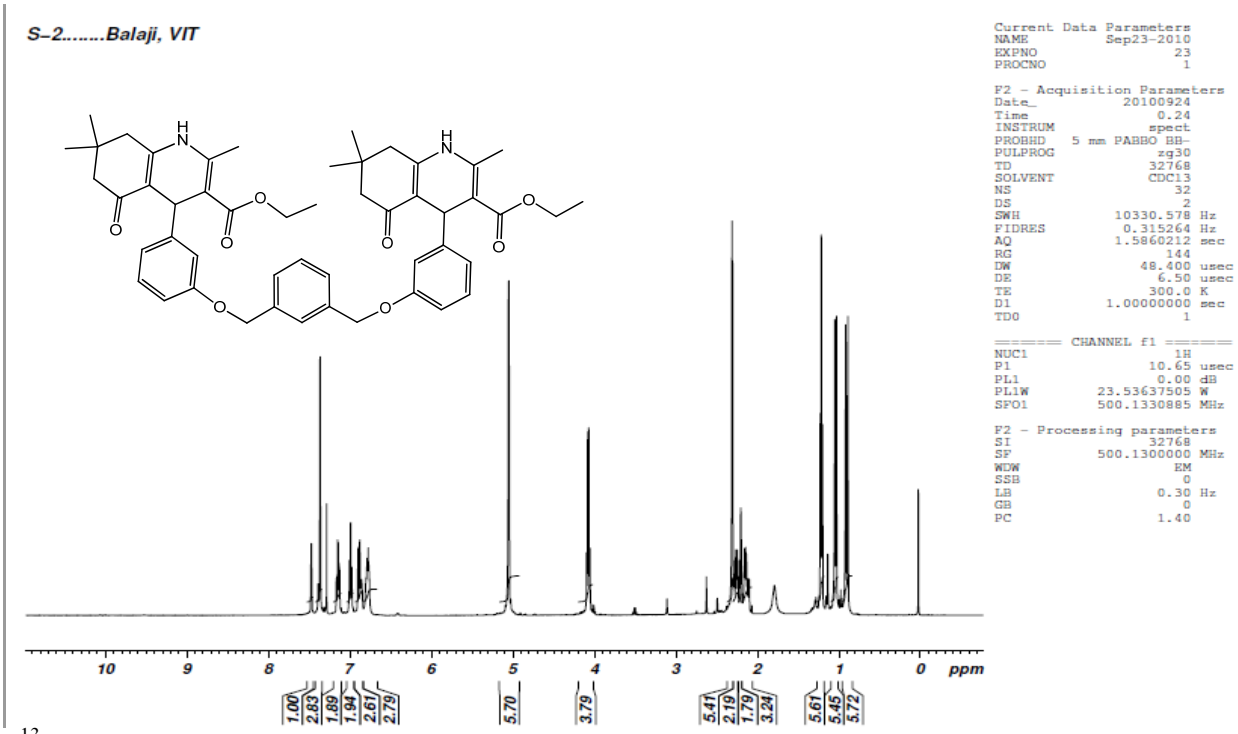
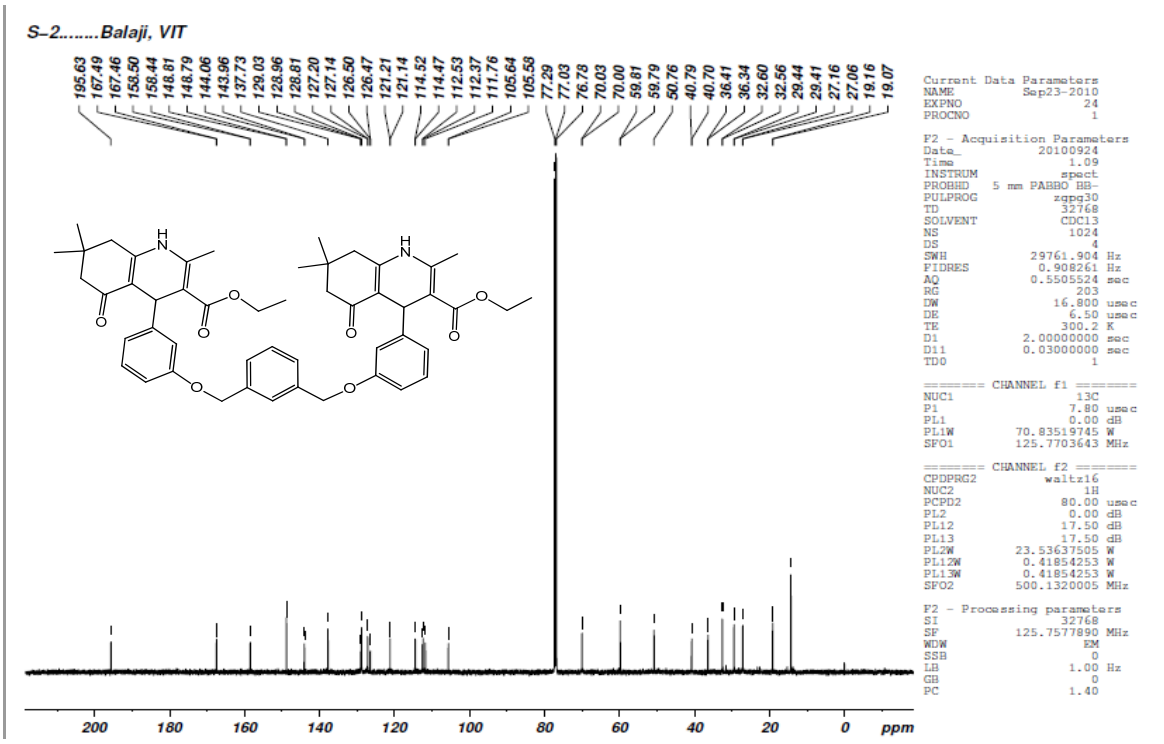
^{1}H NMR of Diethyl 4,4'-(3,3'-(1,3-phenylenebis(methylene)bis(oxy)bis(3,1-phenylene))bis(2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate) [**10a]**



^{13}C NMR of Diethyl 4,4'-(3,3'-(1,3-phenylenebis(methylene)bis(oxy)bis(3,1-phenylene))bis(2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate) [**10a]**



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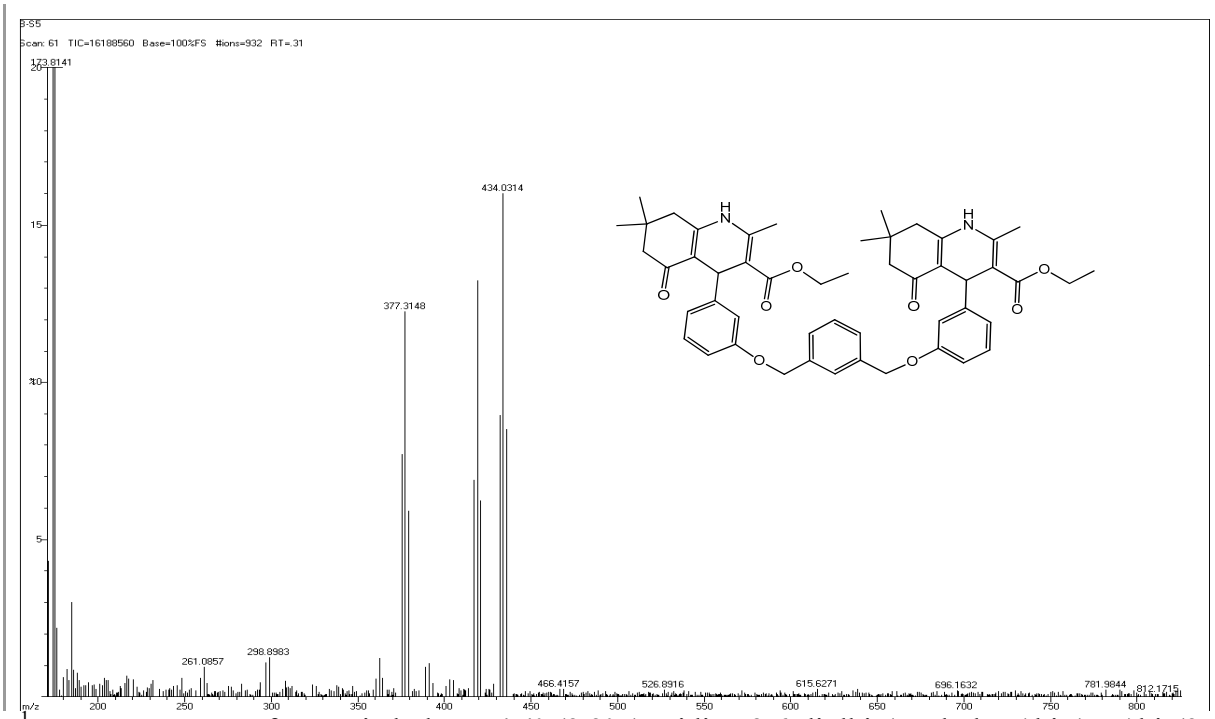
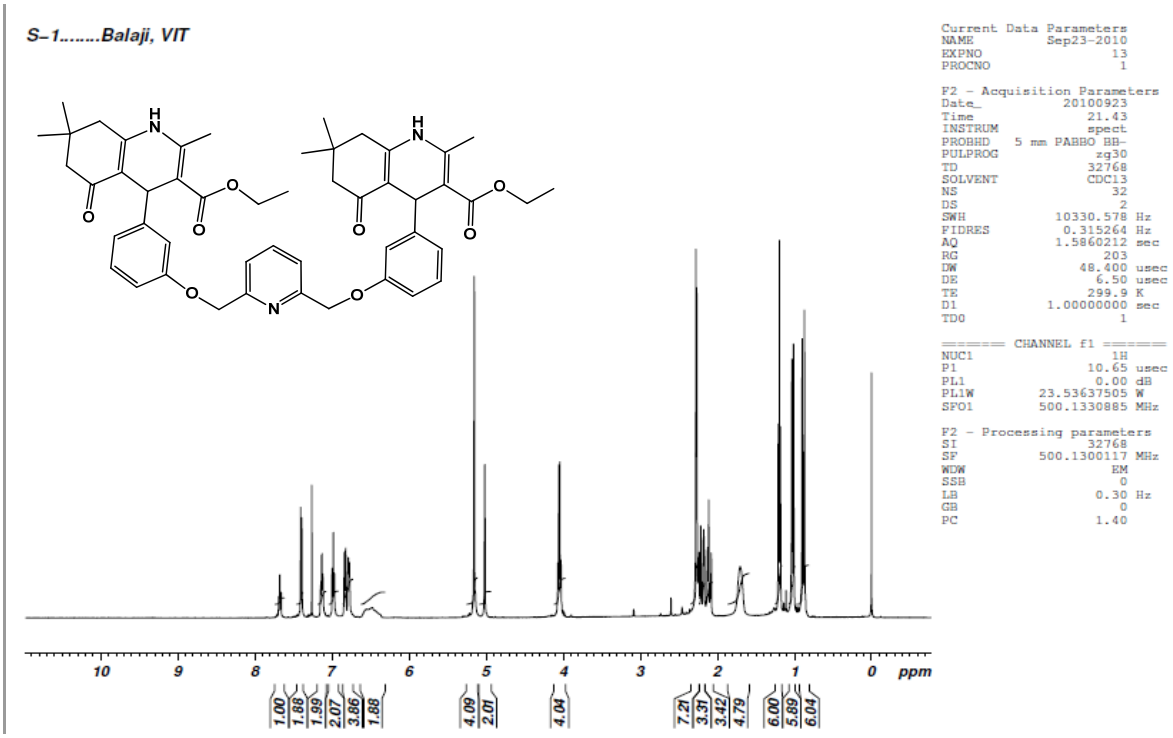
HR-MS of Diethyl 4,4'-(3,3'-(1,3-phenylenebis(methylene)bis(oxy)bis(3,1-phenylene))bis(2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate) [**10a]**



^{1}H NMR of Diethyl 4,4'-(3,3'-(pyridine-2,6-diylbis(methylene)bis(oxy)bis(3,1-phenylene))bis(2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate) [**10b]**



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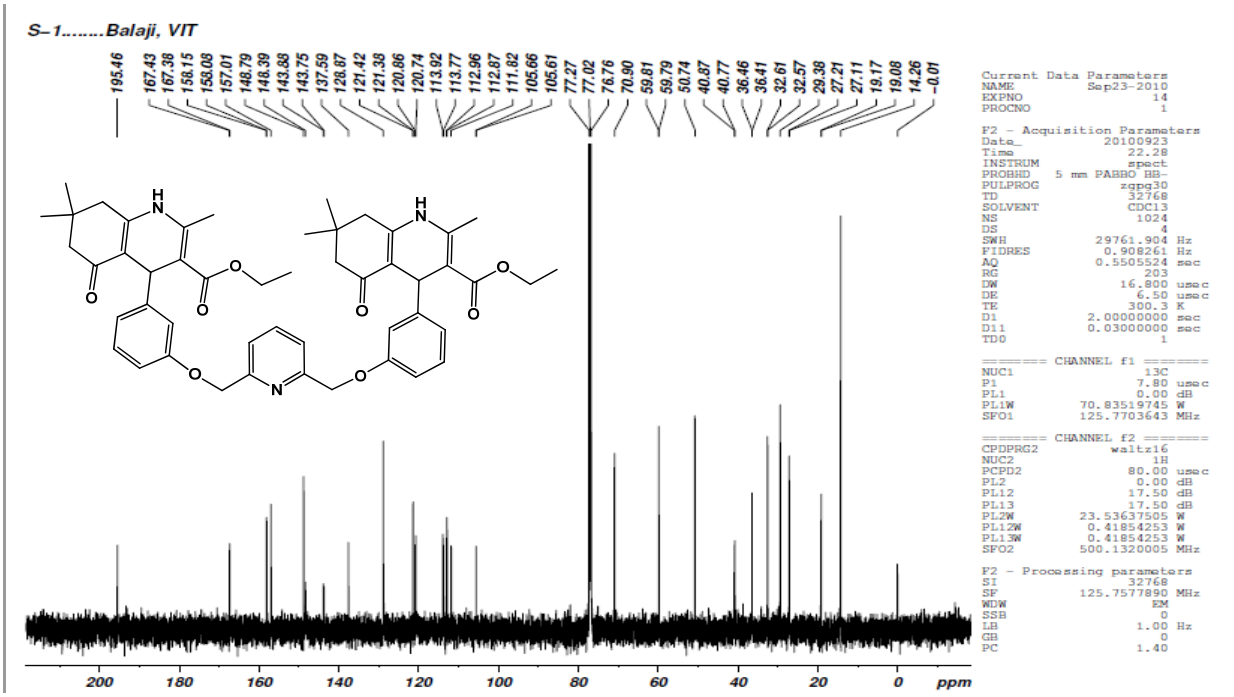
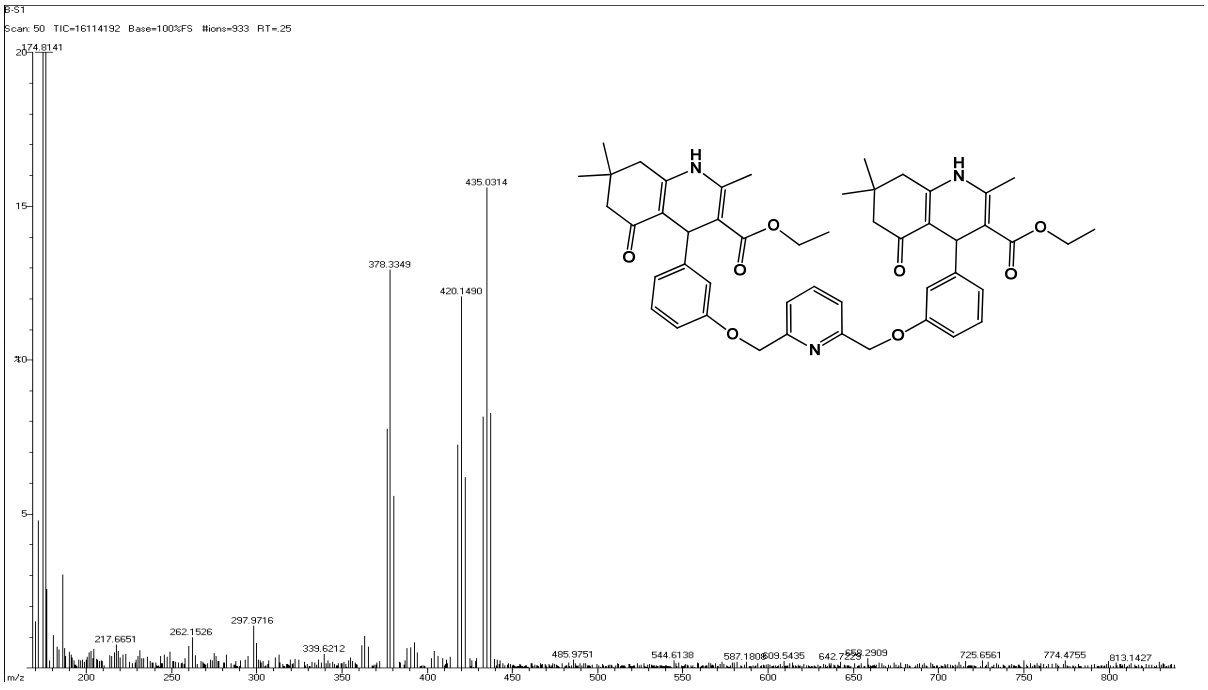
^{13}C NMR of Diethyl 4,4'-(3,3'-(pyridine-2,6-diylbis(methylene)bis(oxy)bis(3,1-phenylene))bis(2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate) [**10b]**



HR-MS of Diethyl 4,4'-(3,3'-(pyridine-2,6-diyl*bis*(methylene)*bis*(oxy)*bis*(3,1-phenylene)) *bis*(2,7,7-trimethyl-5-oxo-1,4,5,6,7,8-hexahydroquinoline-3-carboxylate) [**10b]**



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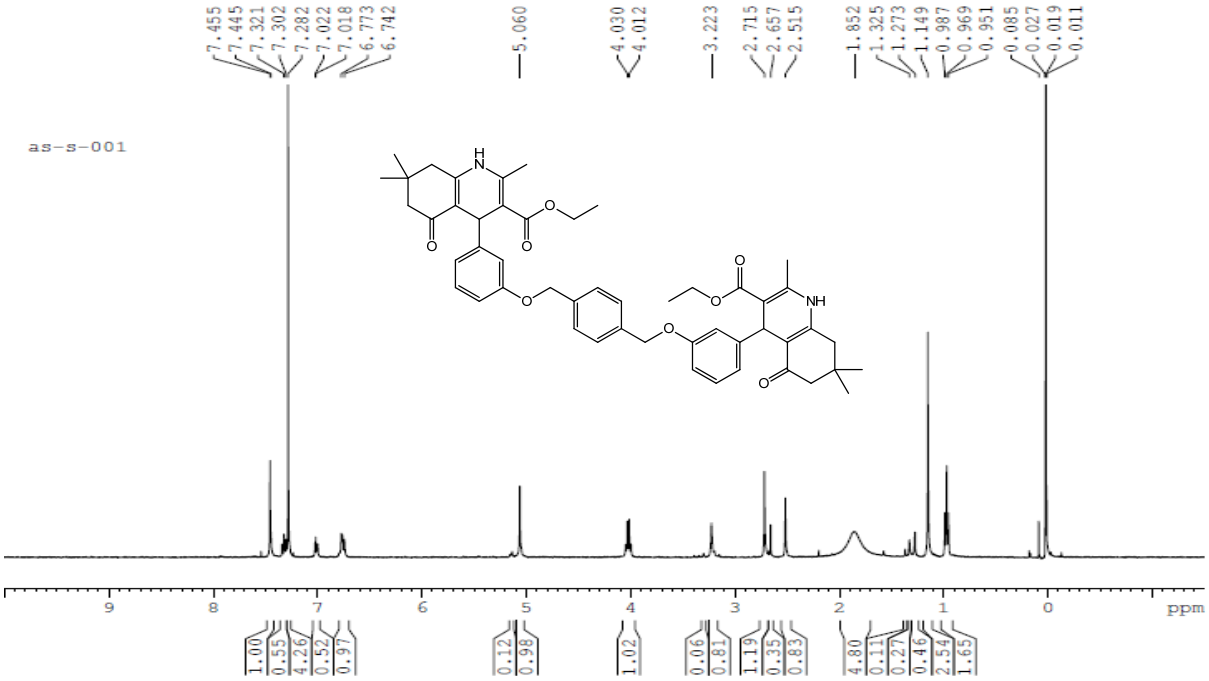
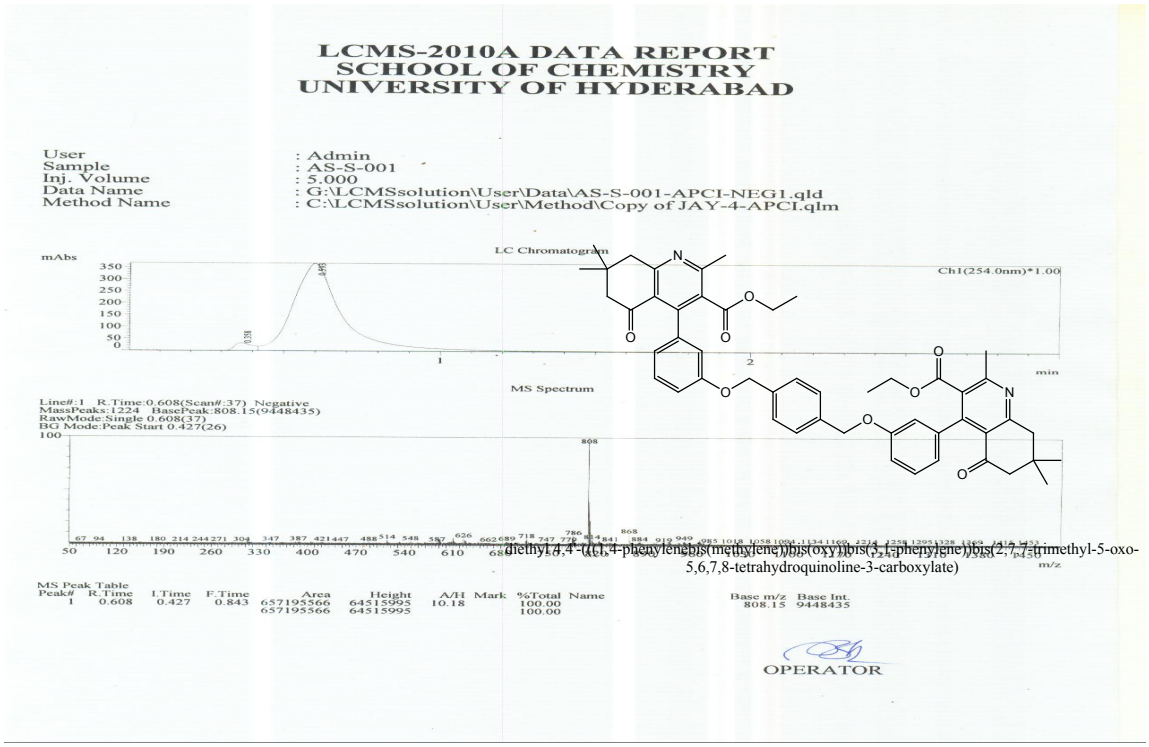
^{1}H NMR of Diethyl 4,4'-(((1,4-phenylenebis(methylene))bis(oxy))bis(3,1-phenylene))bis(2,7,7-trimethyl-5-oxo-5,6,7,8-tetrahydroquinoline-3-carboxylate) [**28**]



LC-MS of Diethyl 4,4'-(((1,4-phenylenebis(methylene))bis(oxy))bis(3,1-phenylene))bis(2,7,7-trimethyl-5-oxo-5,6,7,8-tetrahydroquinoline-3-carboxylate*)* [**28**]



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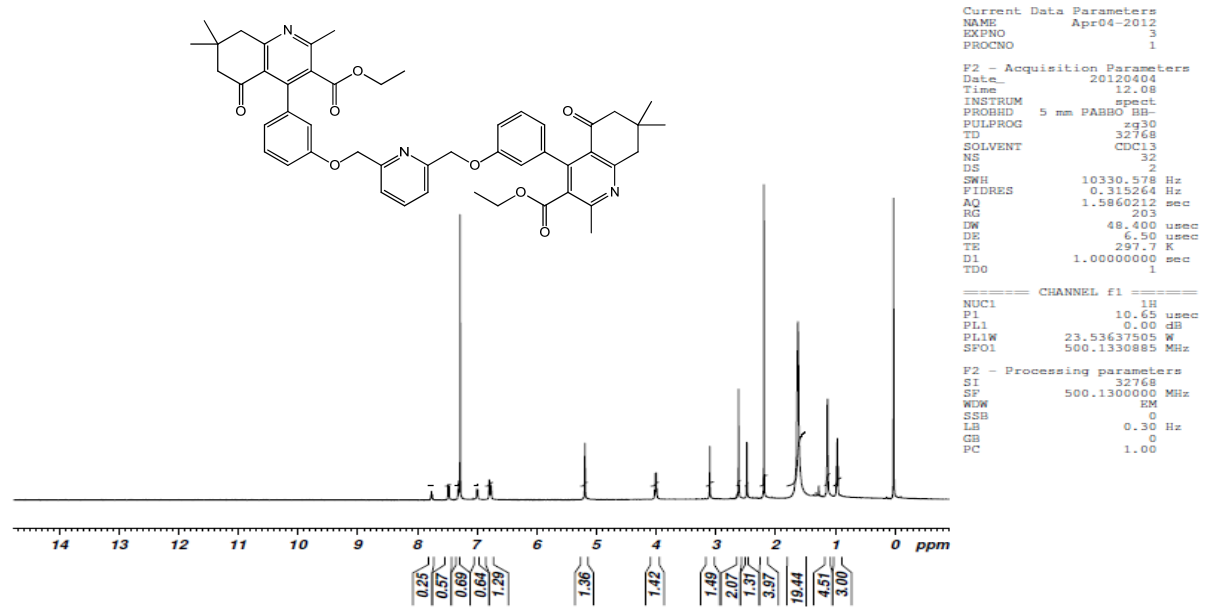
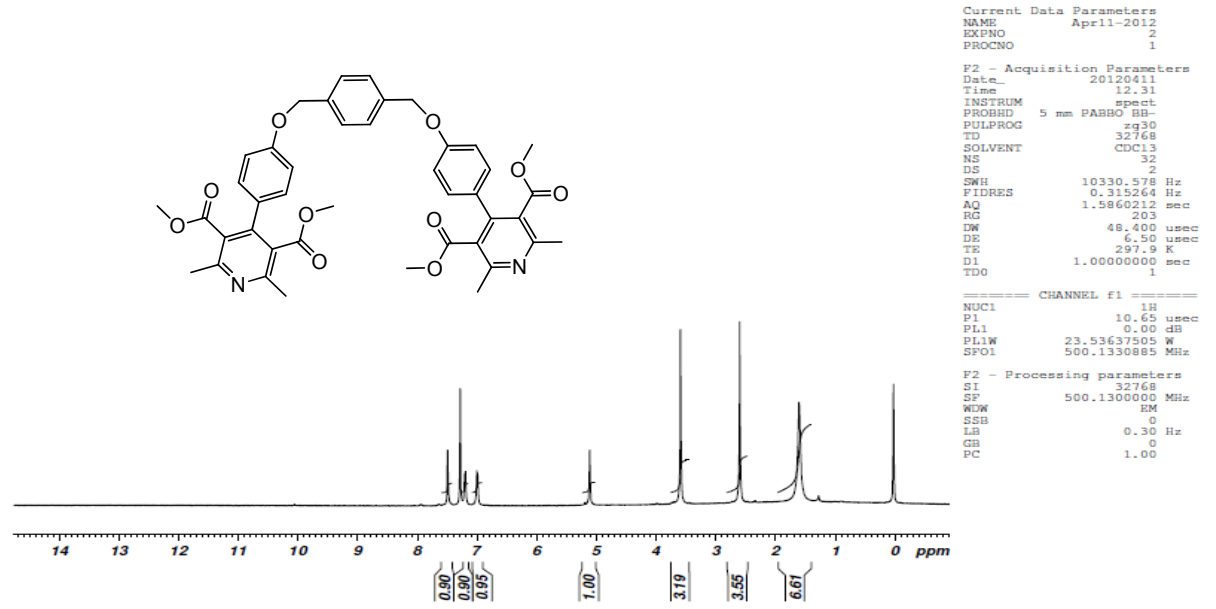
^{1}H NMR of Diethyl 4,4'-(((pyridine-2,6-diylbis(methylene))bis(oxy))bis(3,1-phenylene))bis(2,7,7-trimethyl-5-oxo-5,6,7,8-tetrahydroquinoline-3-carboxylate) **[29a]**

S–4.....Balaji.



^{1}H NMR of Tetramethyl 4,4'-(((1,4-phenylenebis(methylene))bis(oxy))bis(4,1-phenylene))bis(2,6-dimethylpyridine-3,5-dicarboxylate) [**33**]

L–7.....Balaji.



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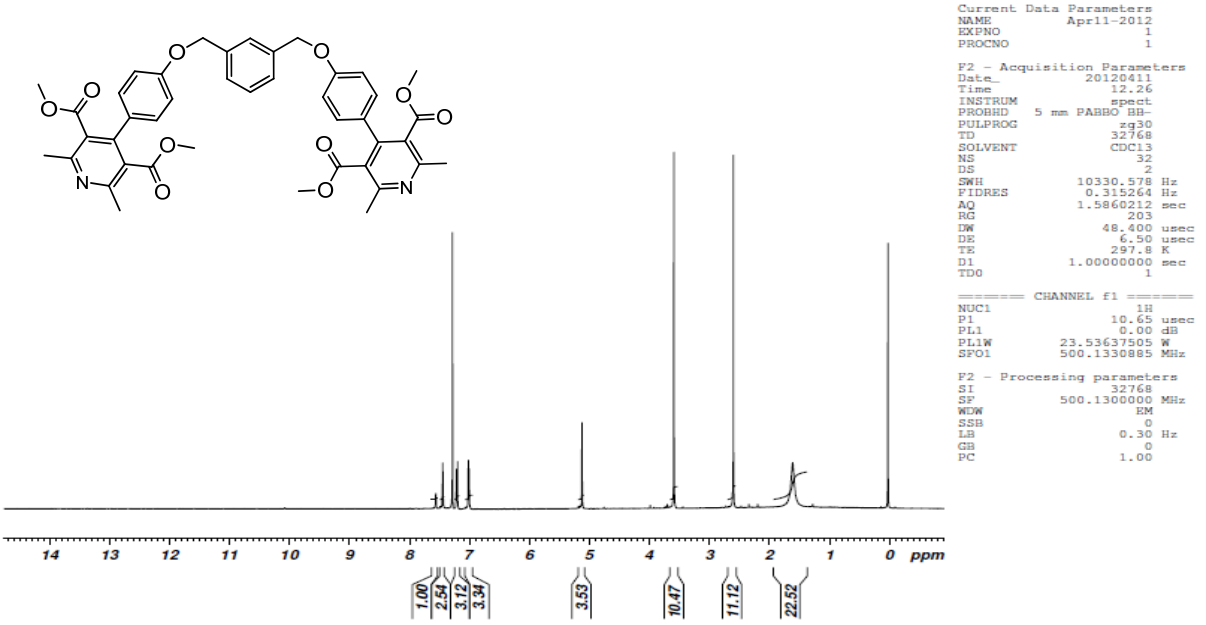
^{1}H NMR of Tetramethyl 4,4'-(((1,3-phenylenebis(methylene))bis(oxy))bis(4,1-phenylene))bis(2,6-dimethylpyridine-3,5-dicarboxylate) **[34]**

L–4.....Balaji.

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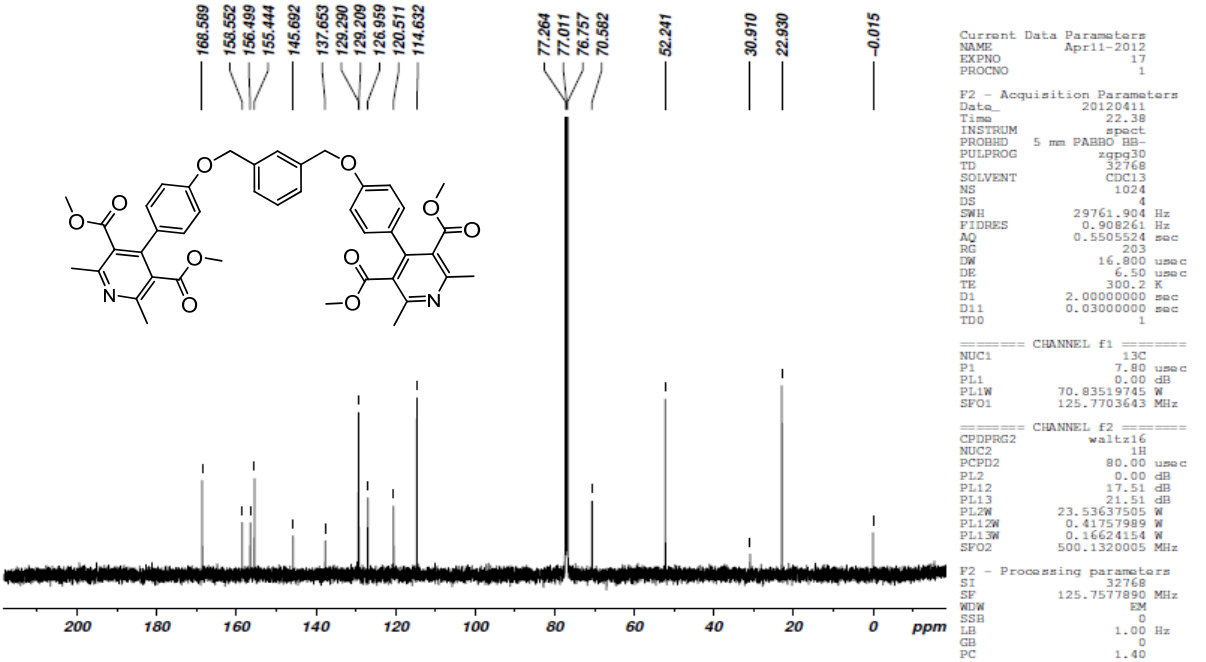
^{13}C NMR of Tetramethyl 4,4'-(((1,3-phenylenebis(methylene))bis(oxy))bis(4,1-phenylene))bis(2,6-dimethylpyridine-3,5-dicarboxylate) **[34]**

L–9.....Balaji.

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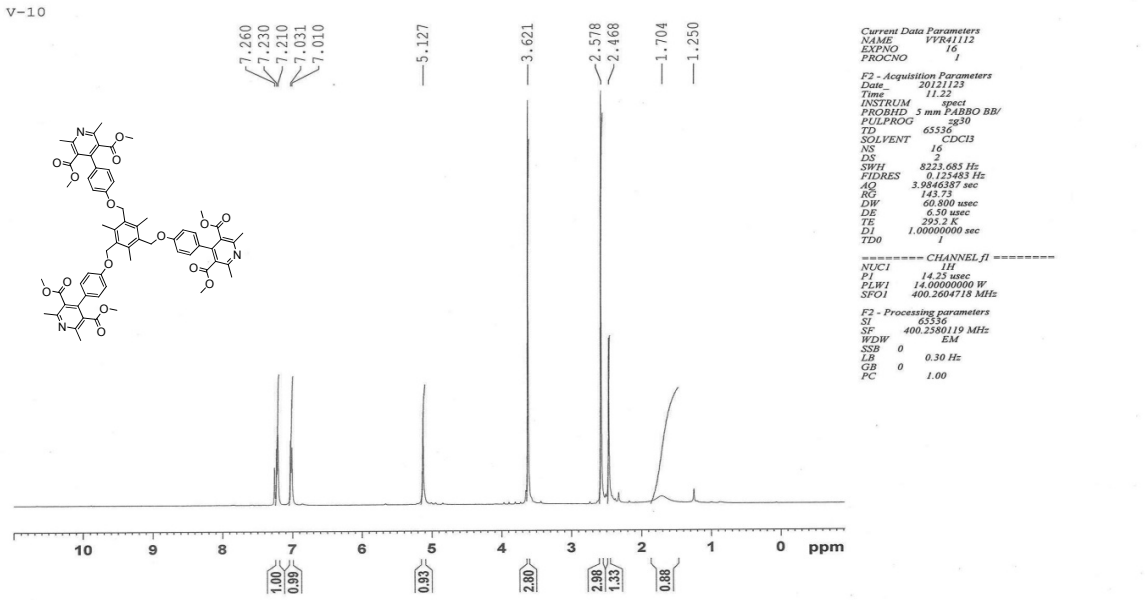
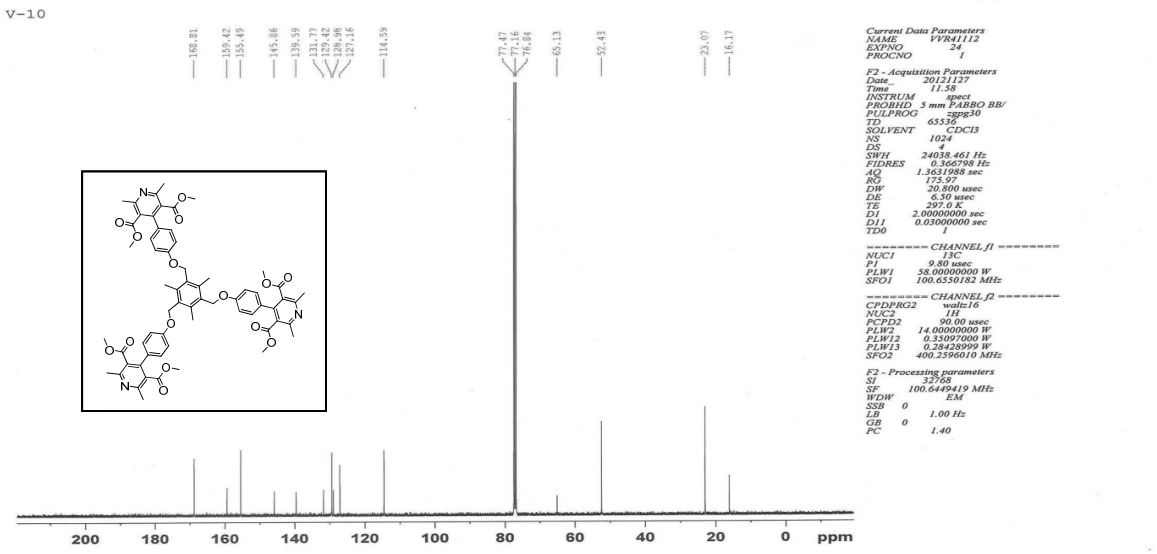
^{1}H NMR spectrum of Hexamethyl 4,4',4"-((((2,4,6-trimethylbenzene-1,3,5-triyl)*tris*(methylene))*tris*(oxy))*tris*(benzene-4,1-diyl))*tris*(2,6-dimethylpyridine-3,5-dicarboxylate) **(36).**



^{13}C NMR spectrum of Hexamethyl 4,4',4"-((((2,4,6-trimethylbenzene-1,3,5-triyl)*tris*(methylene))*tris*(oxy))*tris*(benzene-4,1-diyl))*tris*(2,6-dimethylpyridine-3,5-dicarboxylate) **(36).**



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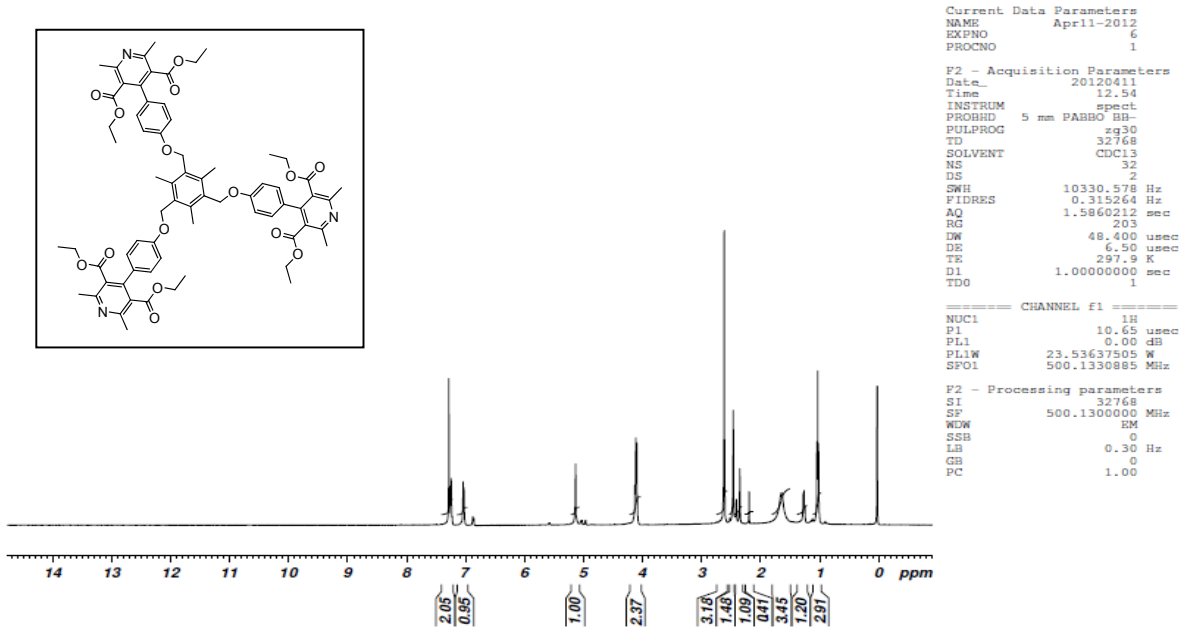
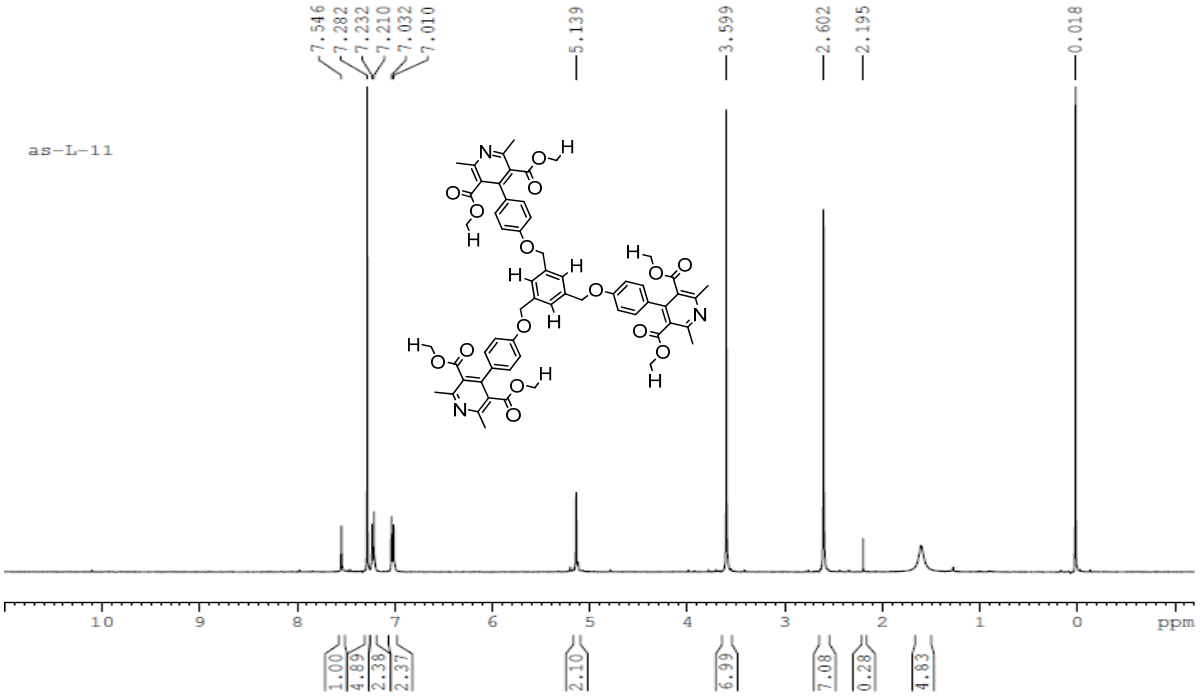
^{1}H NMR spectrum of Hexaethyl 4,4',4''-((((2,4,6-trimethylbenzene-1,3,5-triyl)*tris*(methylene))*tris*(oxy))*tris*(benzene-4,1-diyl))*tris*(2,6-dimethylpyridine-3,5-dicarboxylate) **(37).**



^{1}H NMR of Hexamethyl 4,4',4''-((((benzene-1,3,5-triyl)tris(methylene))tris(oxy))tris(benzene-4,1-diyl))tris(2,6-dimethylpyridine-3,5-dicarboxylate) **[38]**



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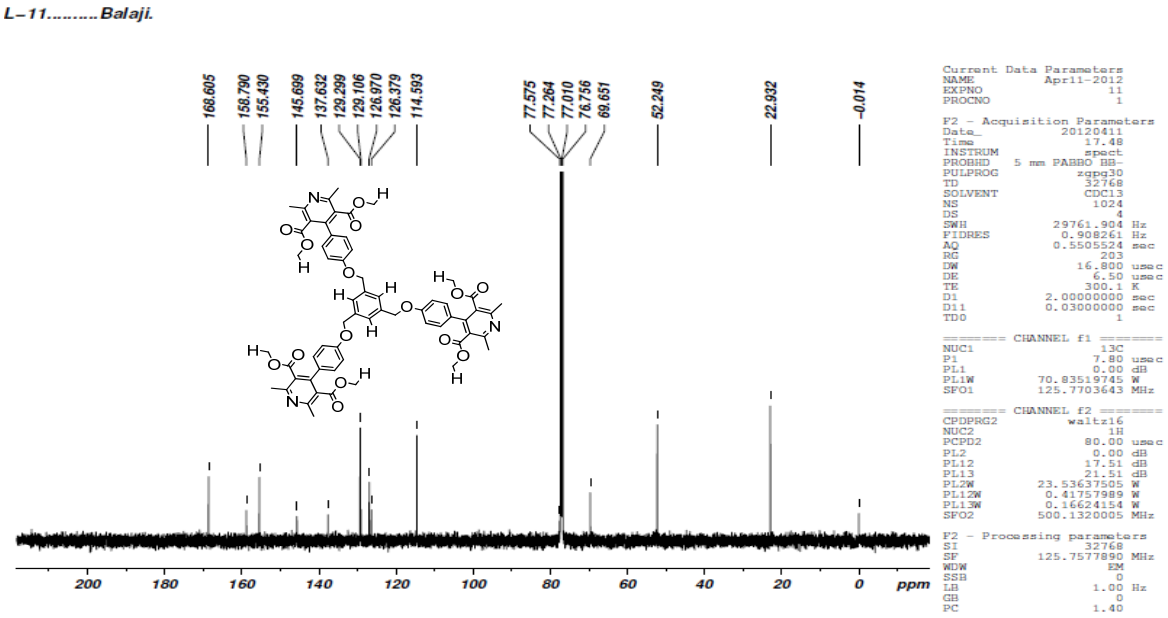
^{13}C NMR of Hexamethyl 4,4',4"-((((benzene-1,3,5-triyl)tris(methylene))tris(oxy))tris(benzene-4,1-diyl))tris(2,6-dimethylpyridine-3,5-dicarboxylate) [**38]**



^{1}H NMR of Octaethyl 4,4′,4″,4‴-(4,4′,4″,4‴-(benzene-1,2,4,5-tetrayltetrakis(methylene))tetrakis(oxy) tetrakis(benzene- 4,1-diyl))tetrakis(2,6-dimethyl-1,4-dihydropyridine-3,5- dicarboxylate) [**39]**