

# Homocoupling reaction of terminal alkynes catalyzed by a reusable cationic 2,2'-bipyridyl palladium(II)/CuI system in water

Shao-Nung Chen, Wei-Yi Wu and Fu-Yu Tsai\*

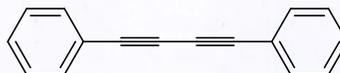
Institute of Organic and Polymeric Materials, National Taipei University of Technology, Taipei 106, Taiwan

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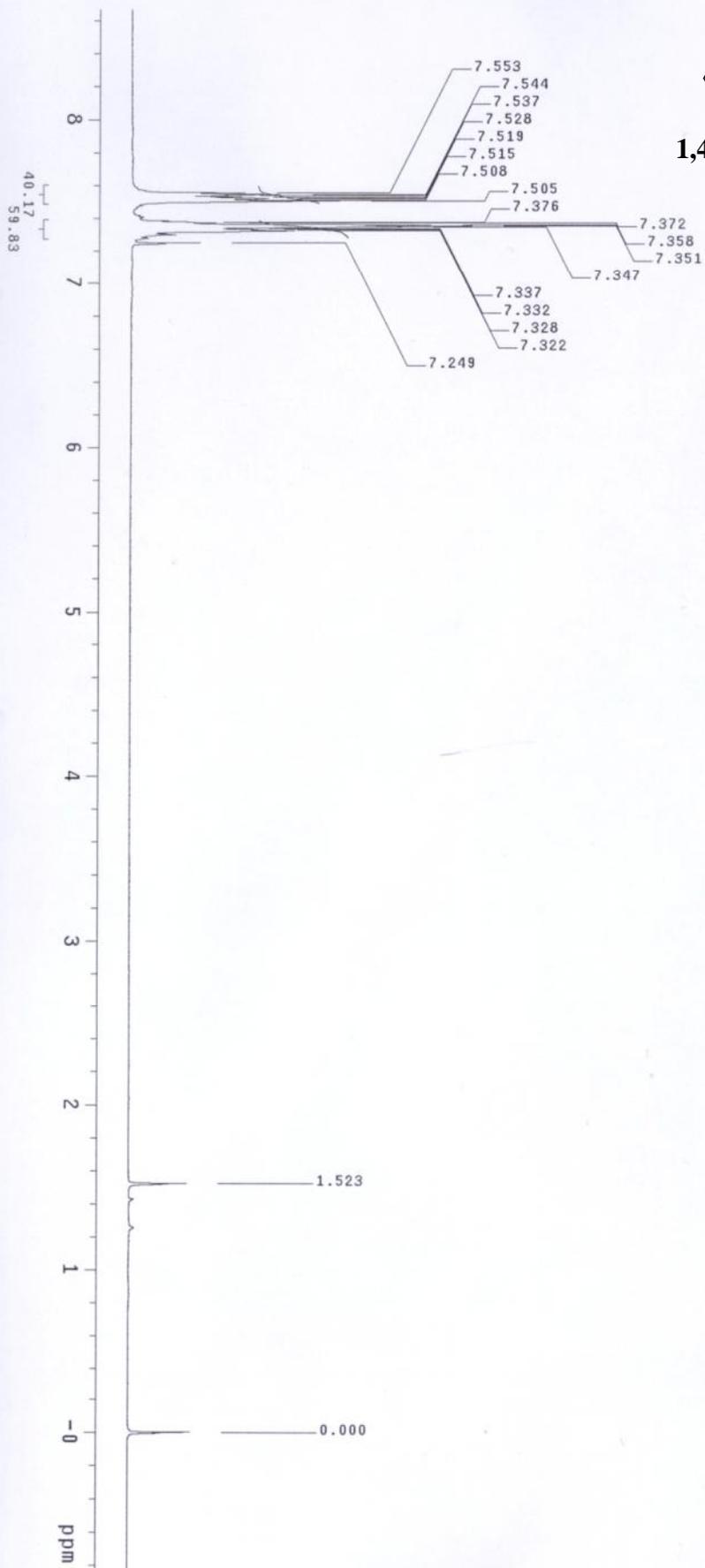
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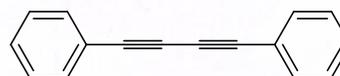
# <sup>1</sup>H NMR



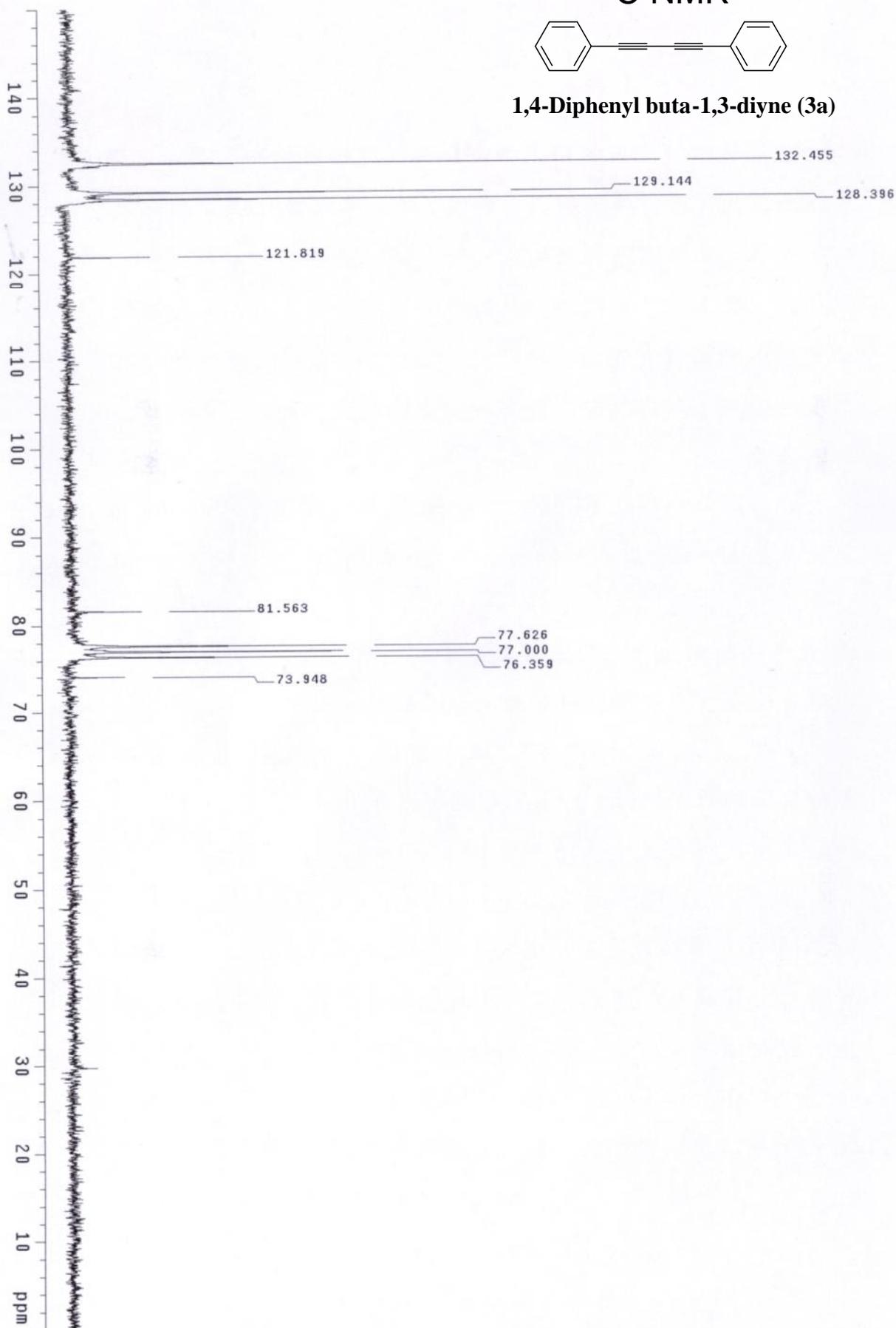
**1,4-Diphenyl buta-1,3-diyne (3a)**



<sup>13</sup>C NMR



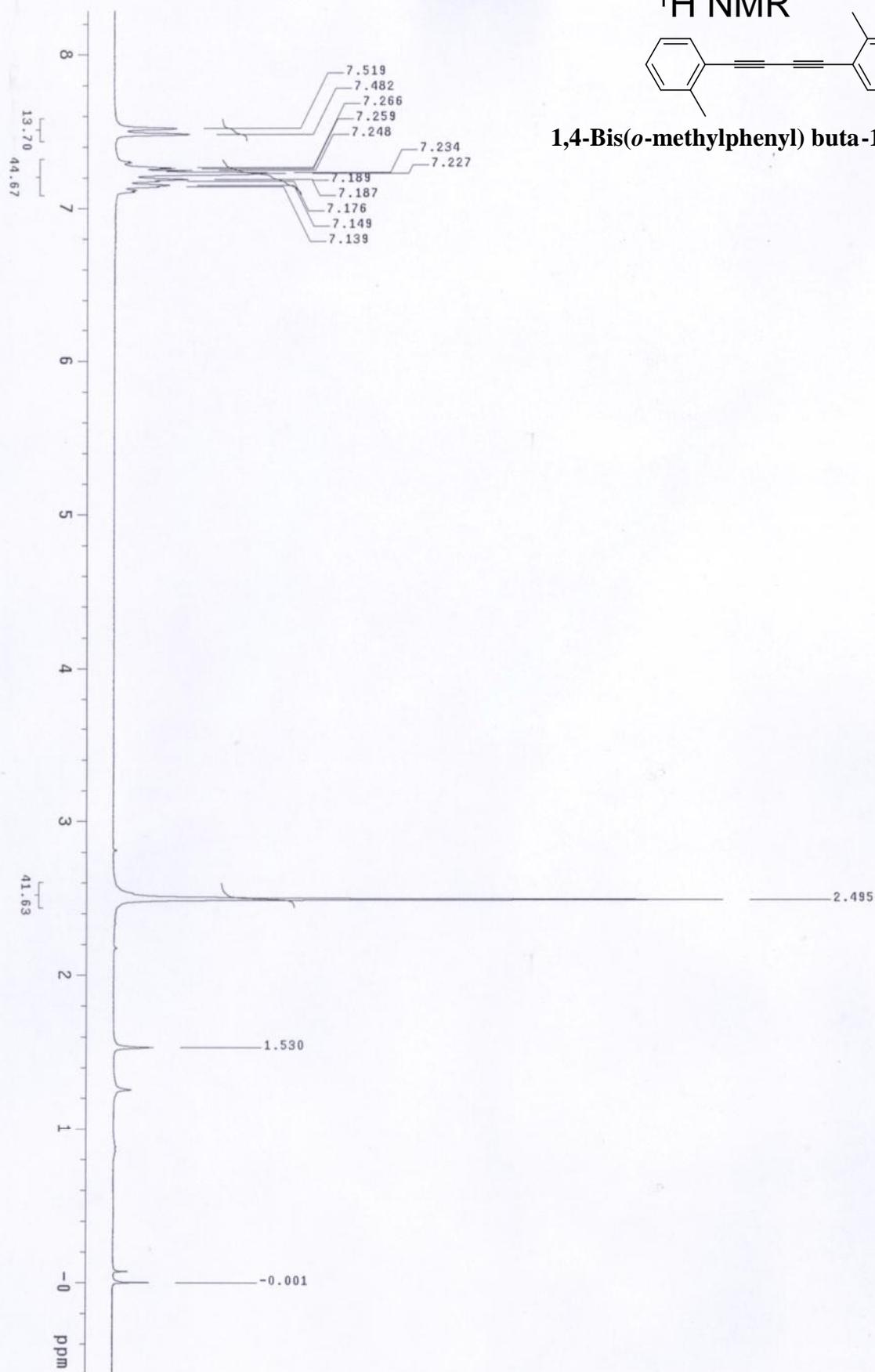
1,4-Diphenyl buta-1,3-diyne (3a)



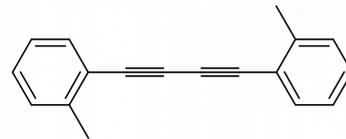
<sup>1</sup>H NMR



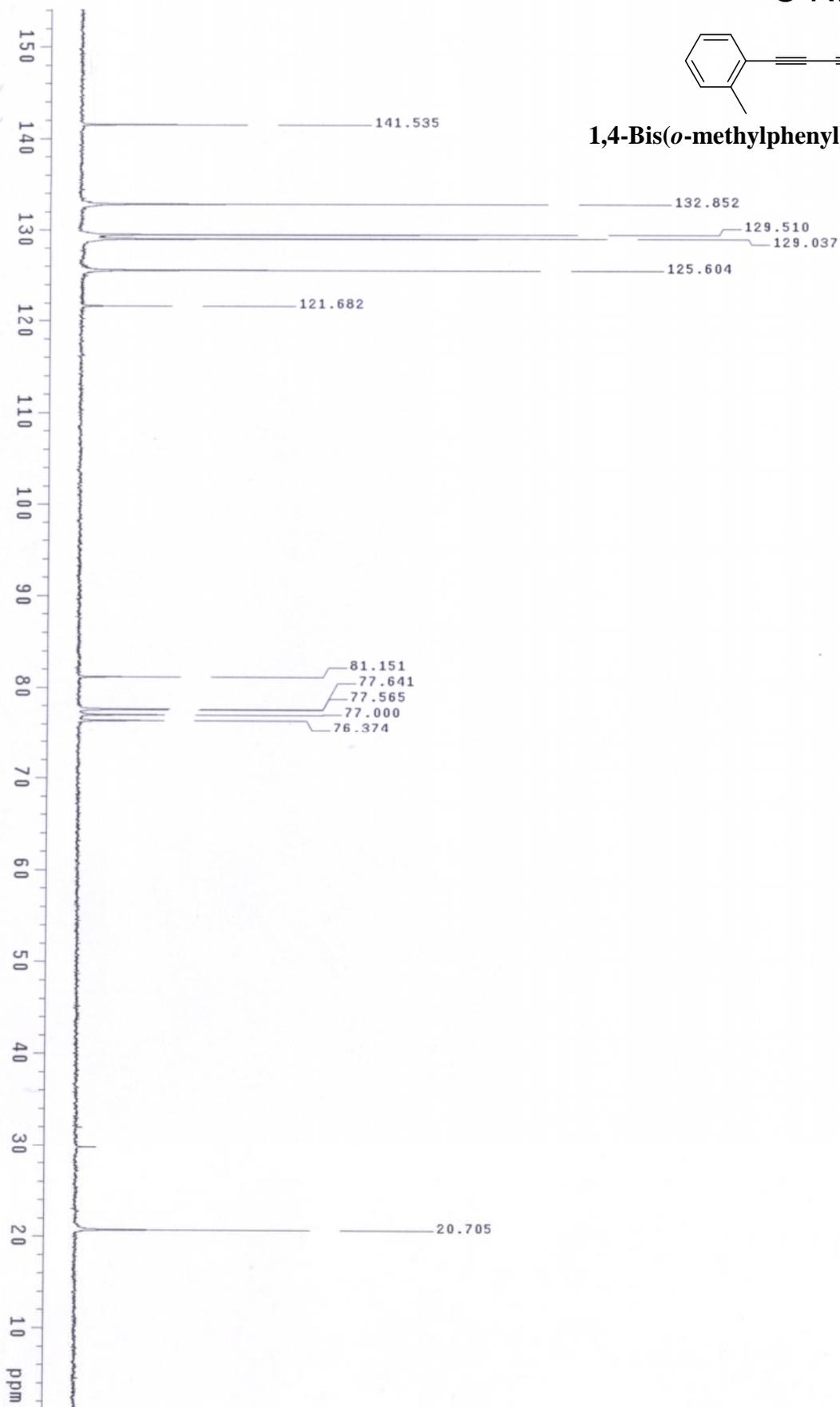
1,4-Bis(*o*-methylphenyl) buta-1,3-diyne (3b)



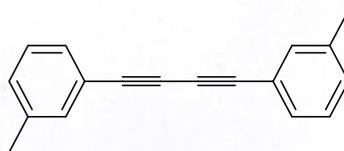
<sup>13</sup>C NMR



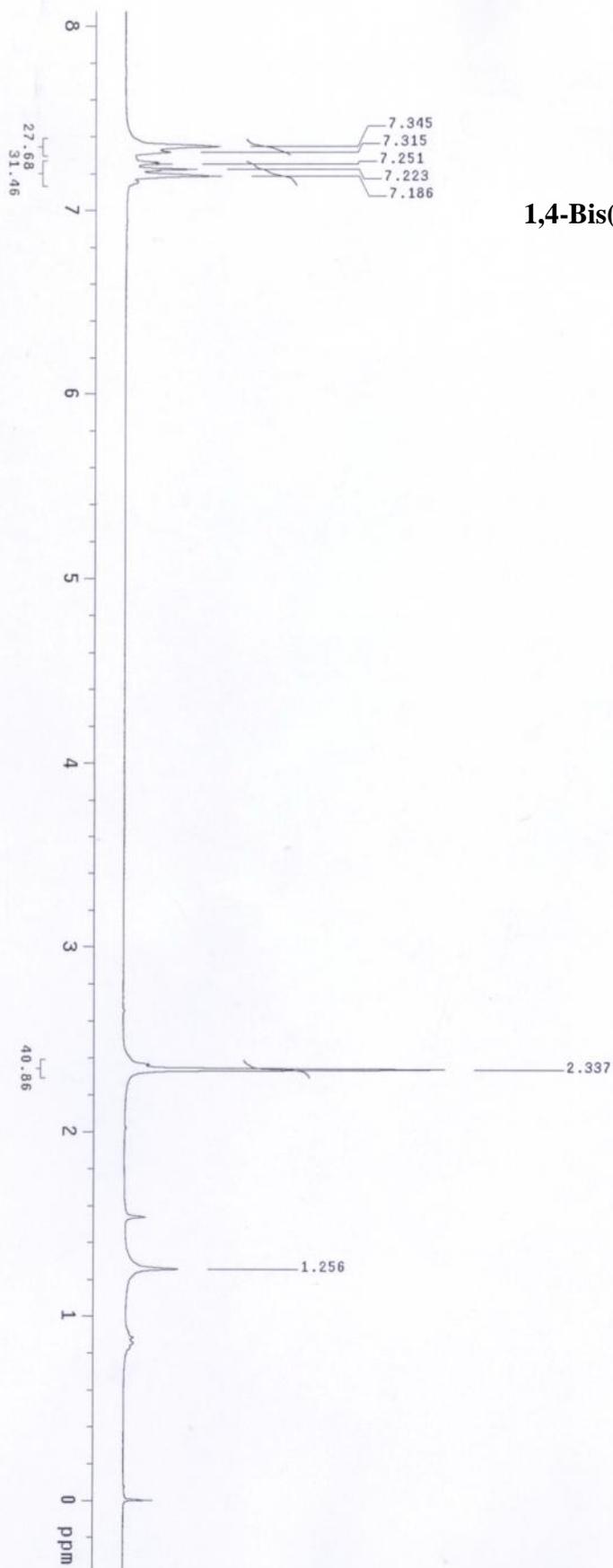
1,4-Bis(*o*-methylphenyl) buta-1,3-diyne (3b)



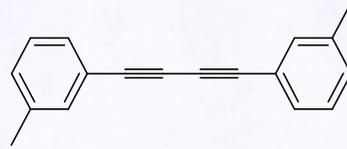
<sup>1</sup>H NMR



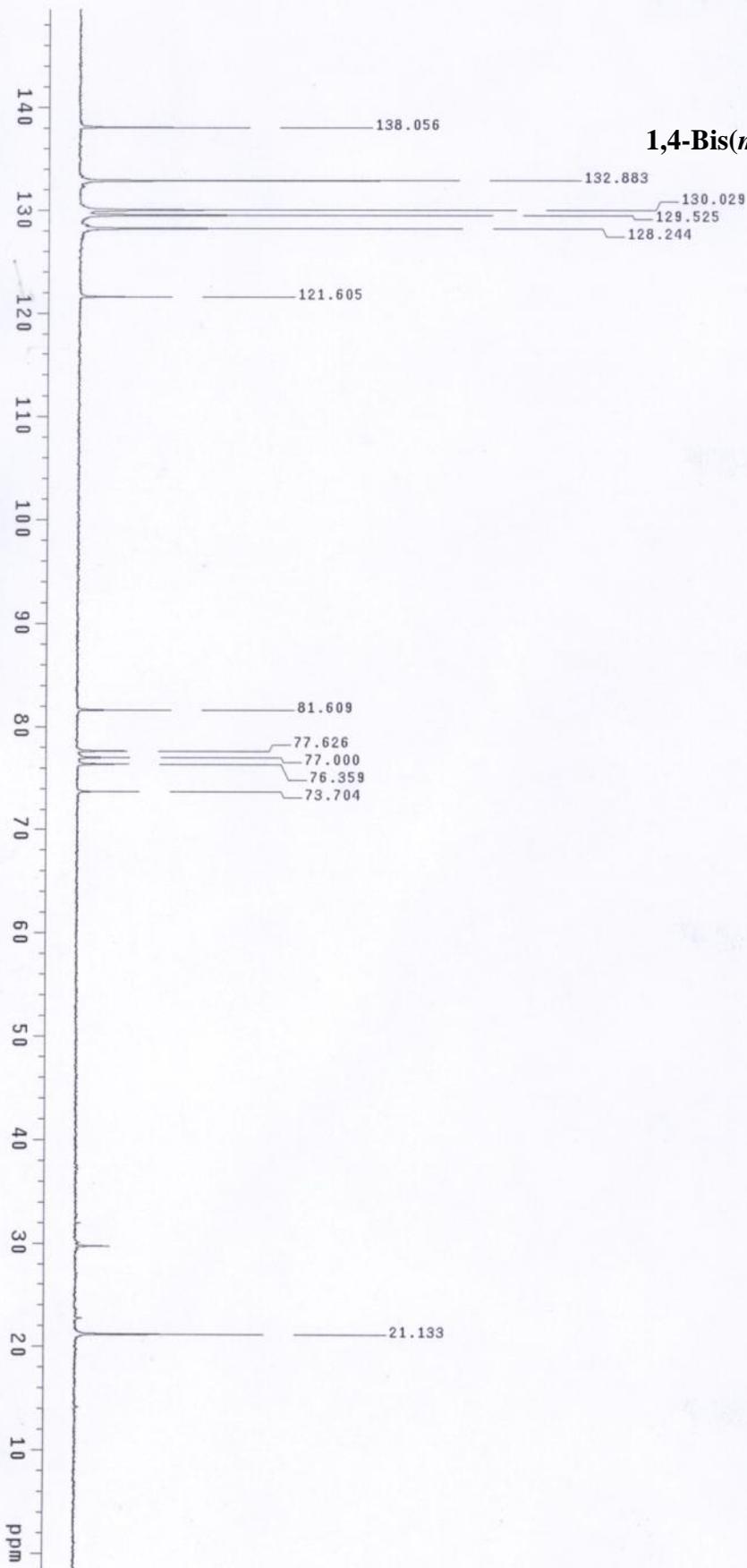
1,4-Bis(*m*-methylphenyl) buta-1,3-diyne (3c)



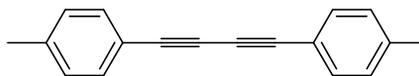
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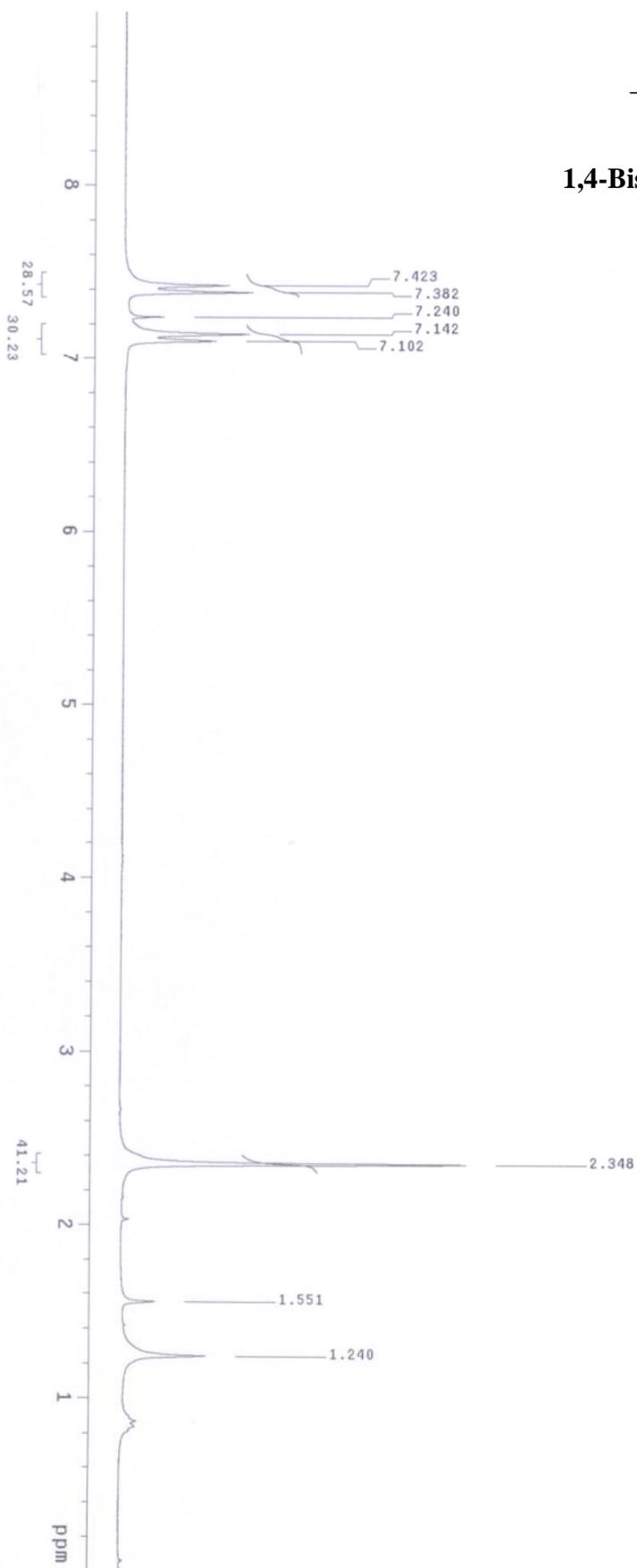
1,4-Bis(*m*-methylphenyl) buta-1,3-diyne (3c)



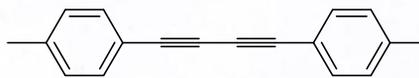
# <sup>1</sup>H NMR



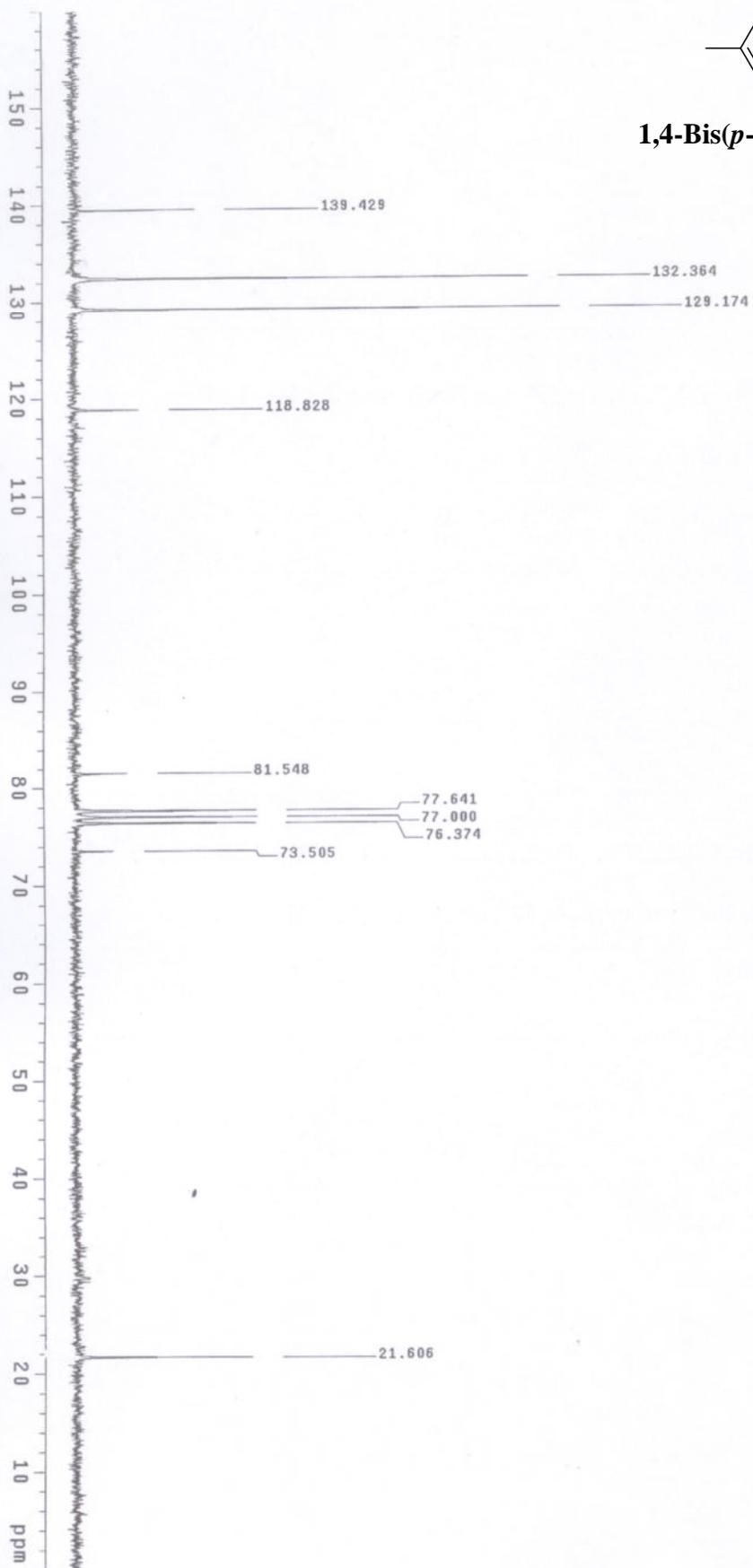
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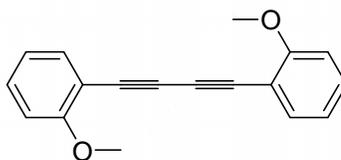
# <sup>13</sup>C NMR



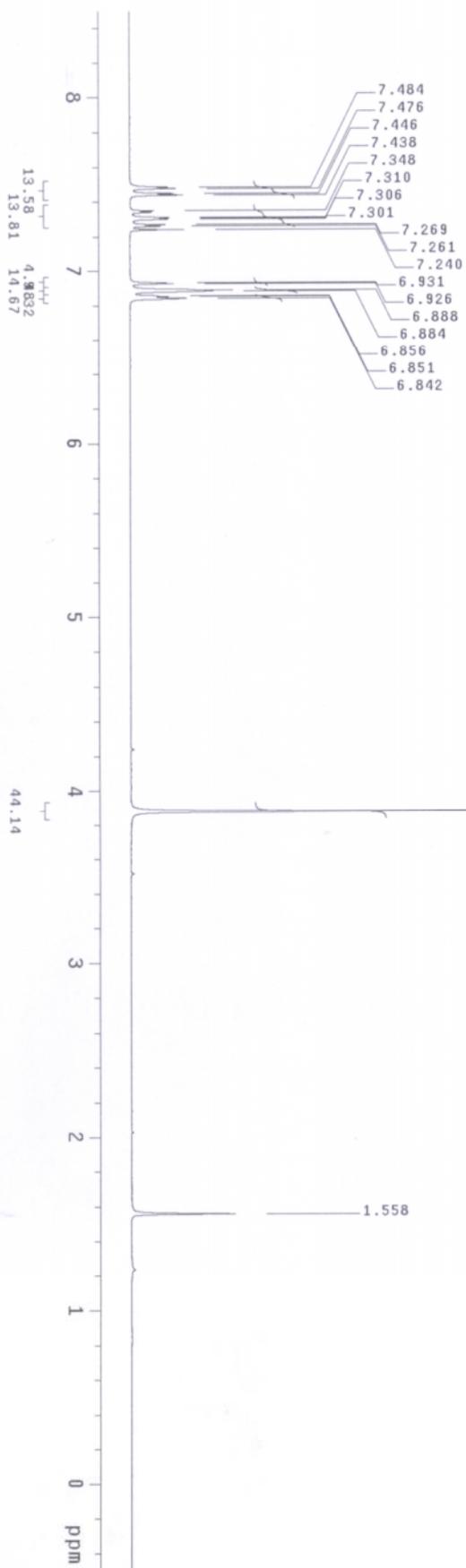
**1,4-Bis(*p*-methylphenyl) buta-1,3-diyne (3d)**



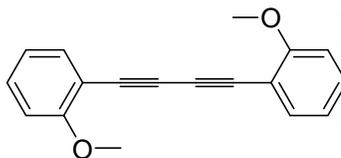
# <sup>1</sup>H NMR



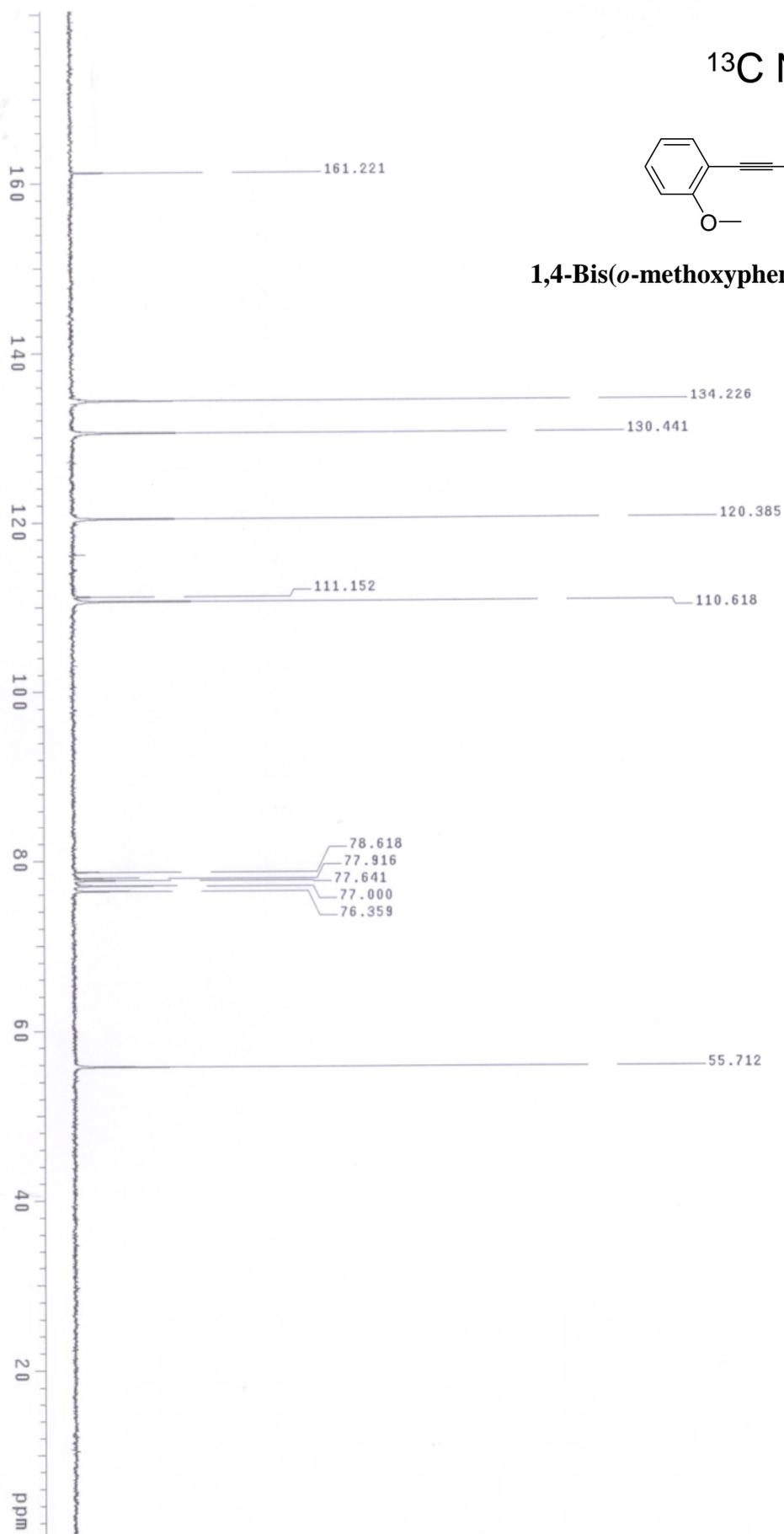
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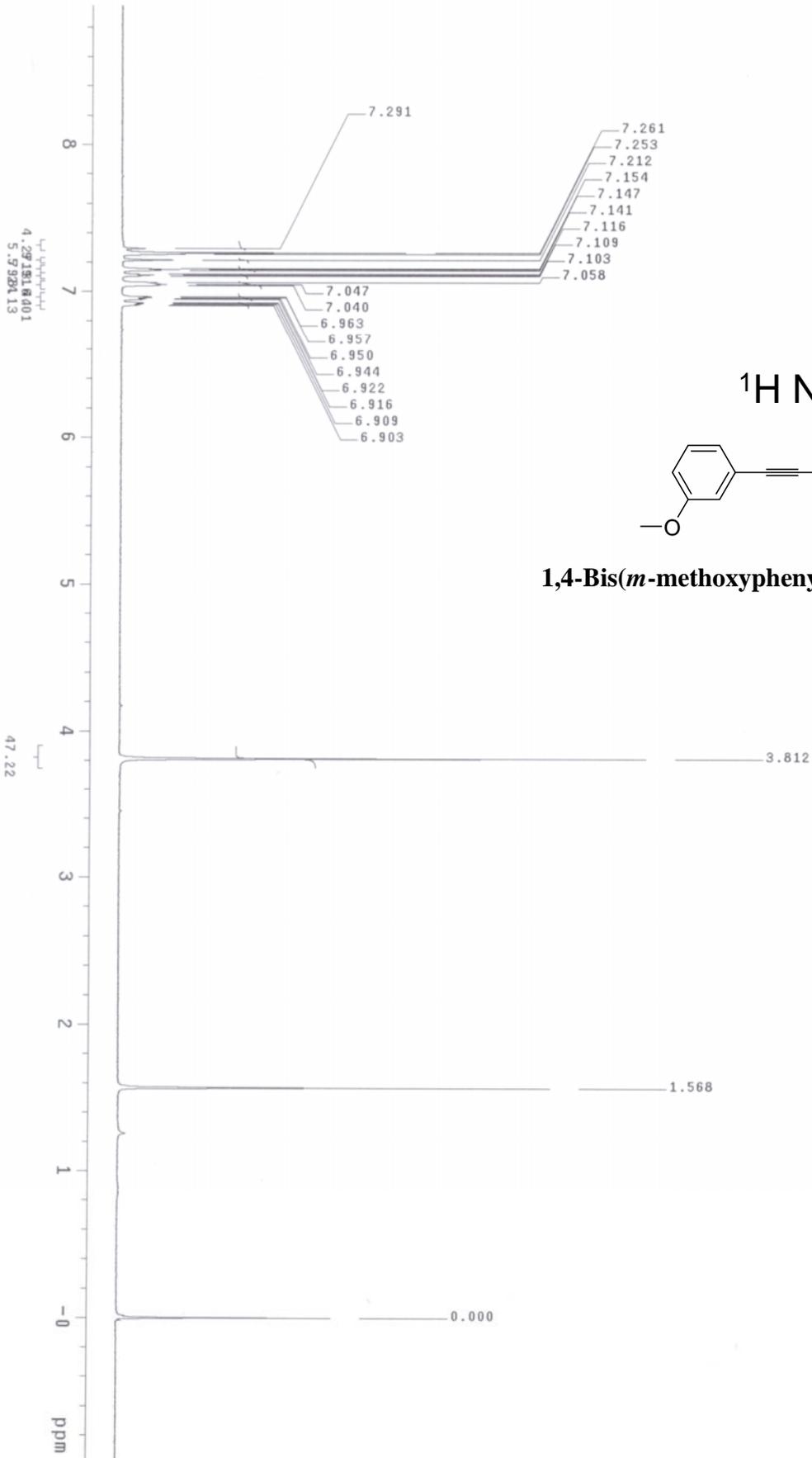


<sup>13</sup>C NMR

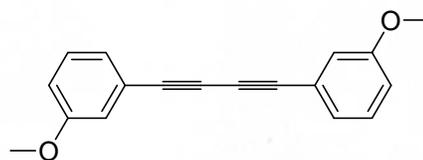


**1,4-Bis(*o*-methoxyphenyl) buta-1,3-diyne (3e)**

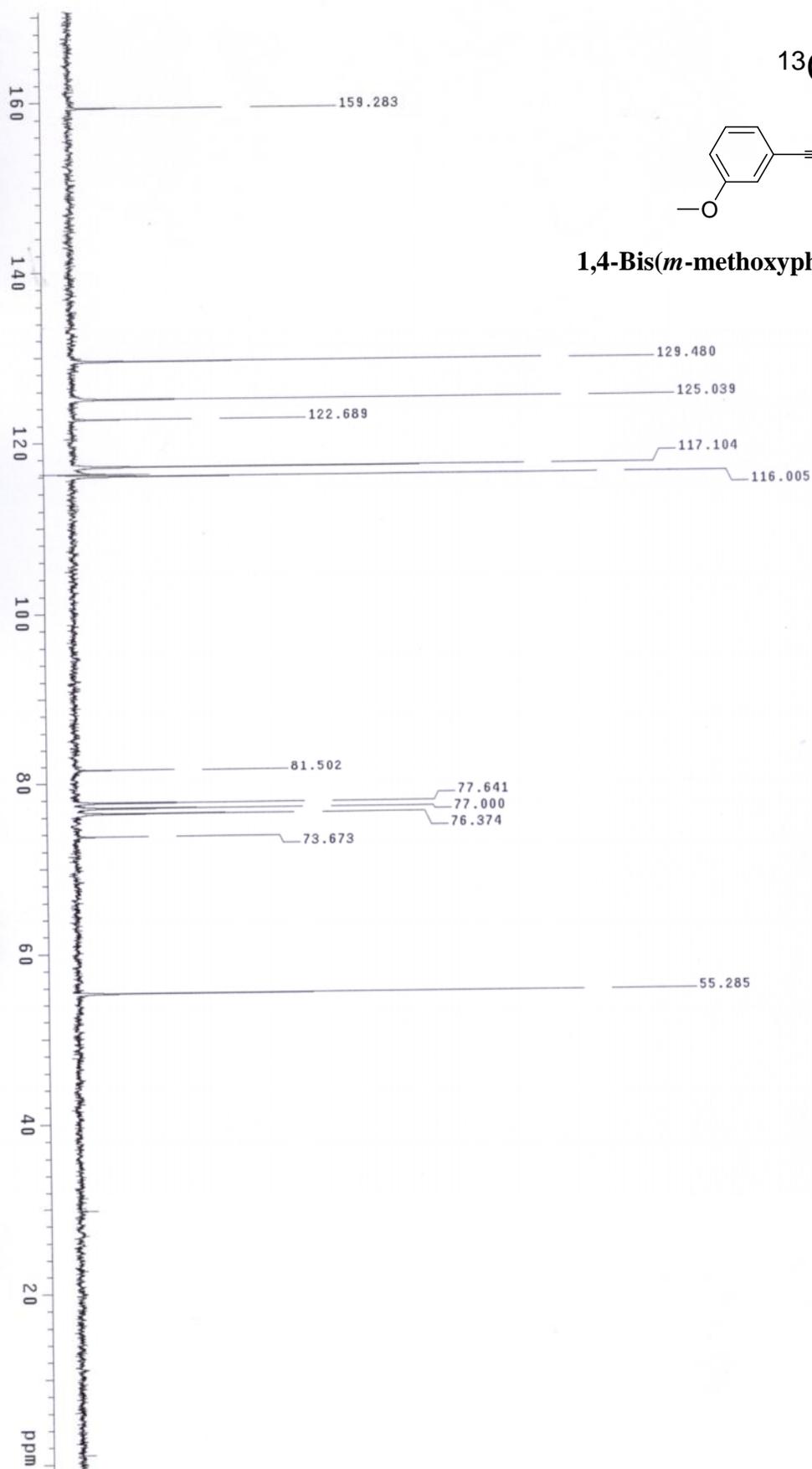




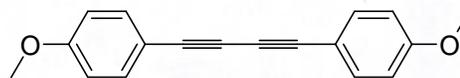
<sup>13</sup>C NMR



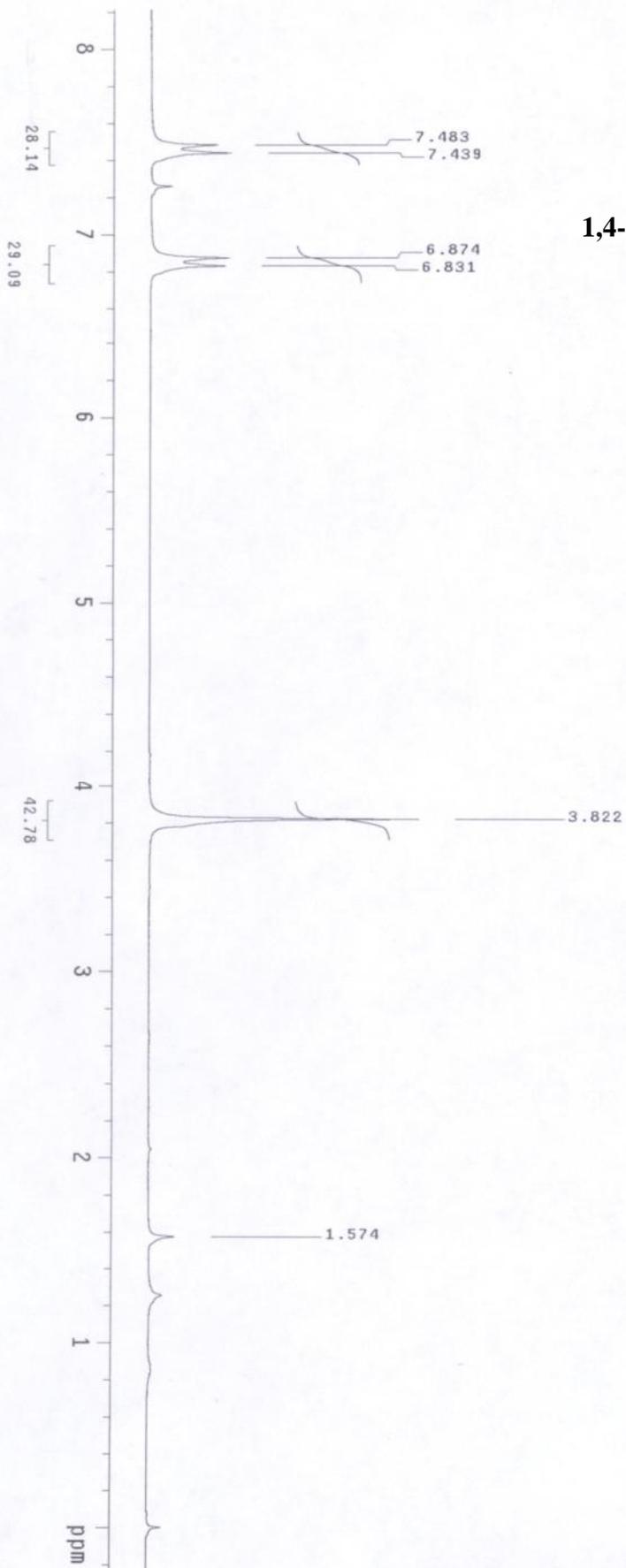
1,4-Bis(*m*-methoxyphenyl) buta-1,3-diyne (3f)



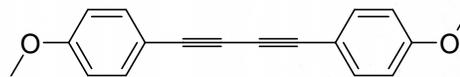
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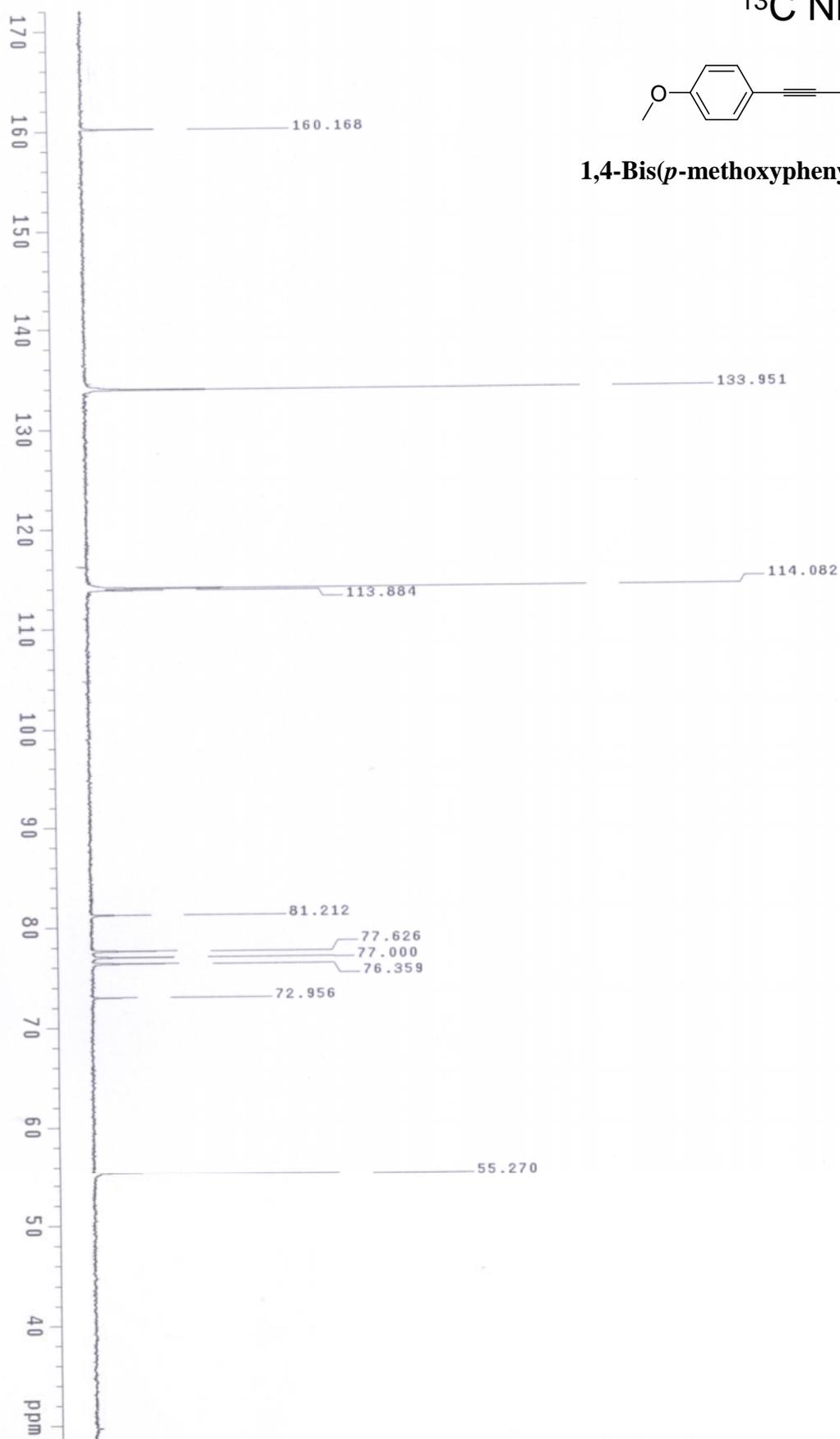
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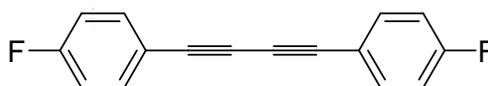
<sup>13</sup>C NMR



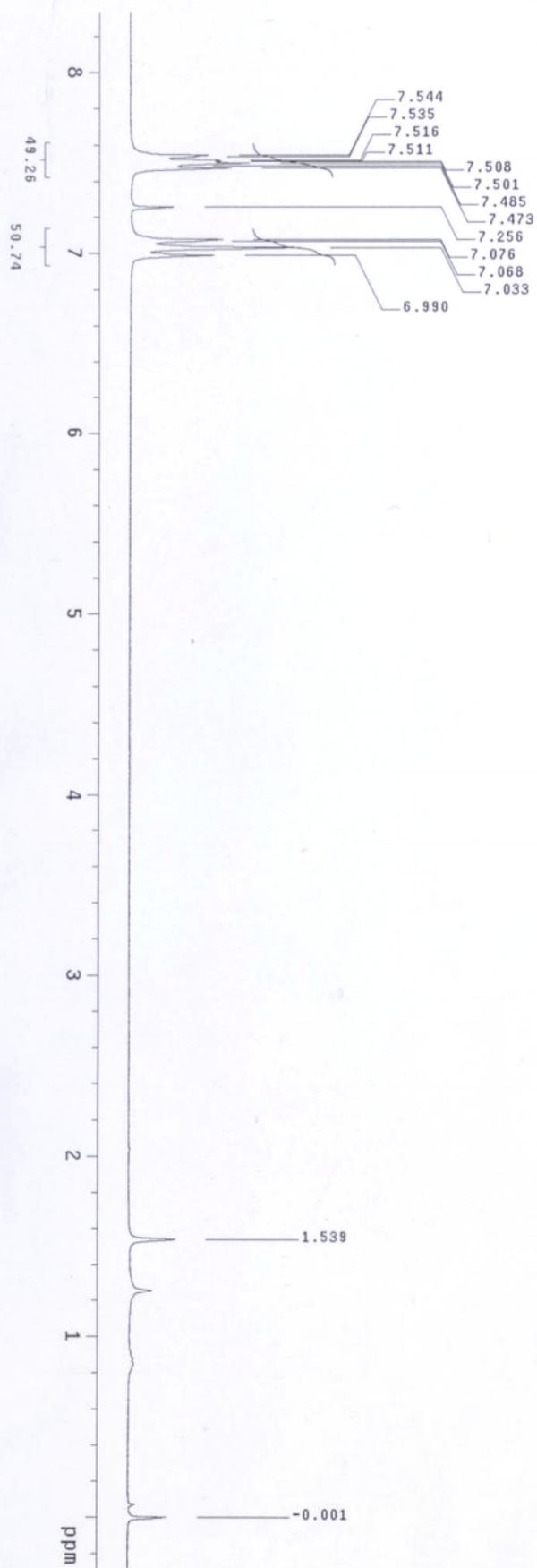
1,4-Bis(*p*-methoxyphenyl) buta-1,3-diyne (3g)



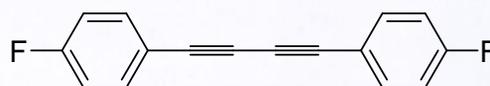
# <sup>1</sup>H NMR



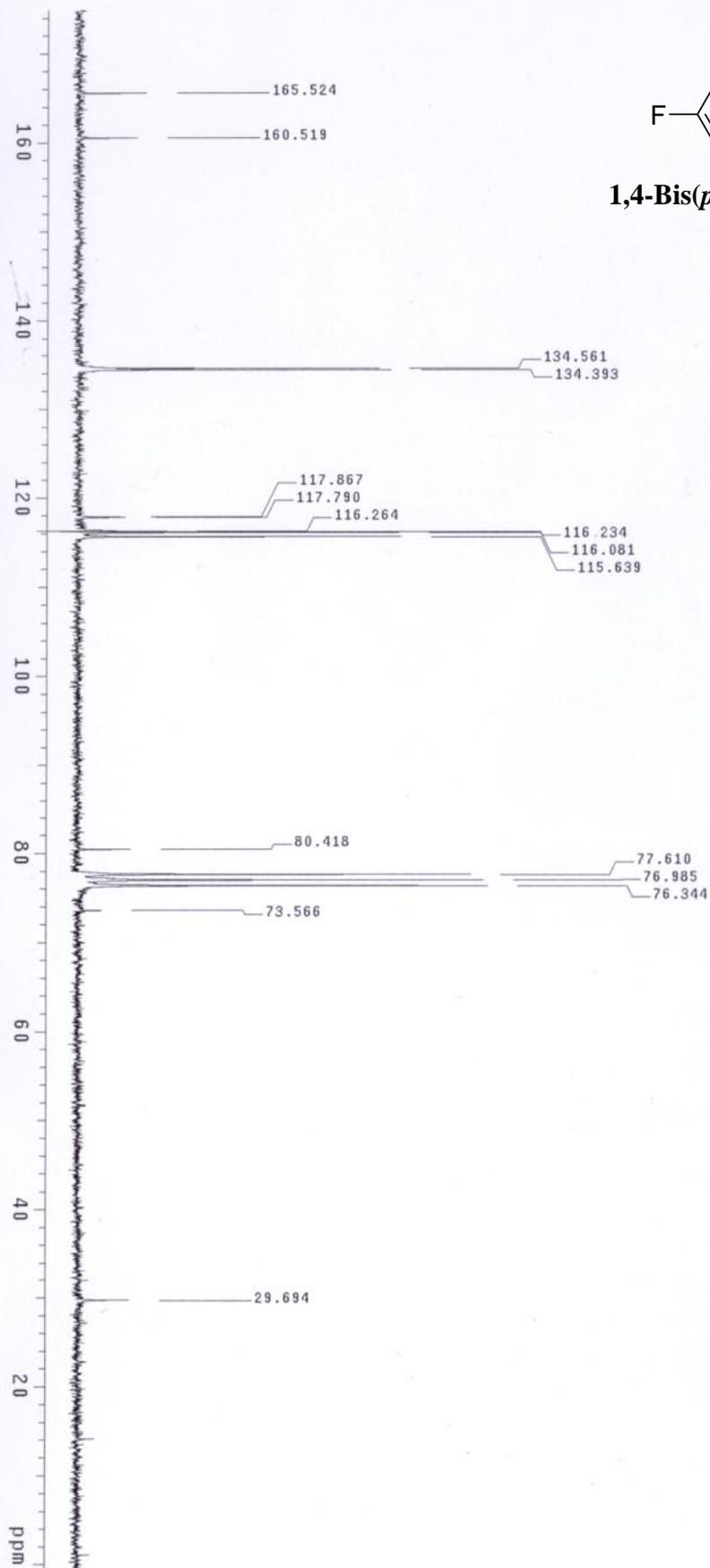
**1,4-Bis(*p*-fluorophenyl) buta-1,3-diyne (3h)**



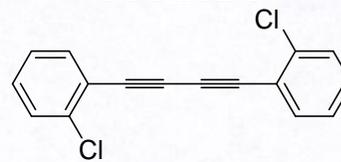
<sup>13</sup>C NMR



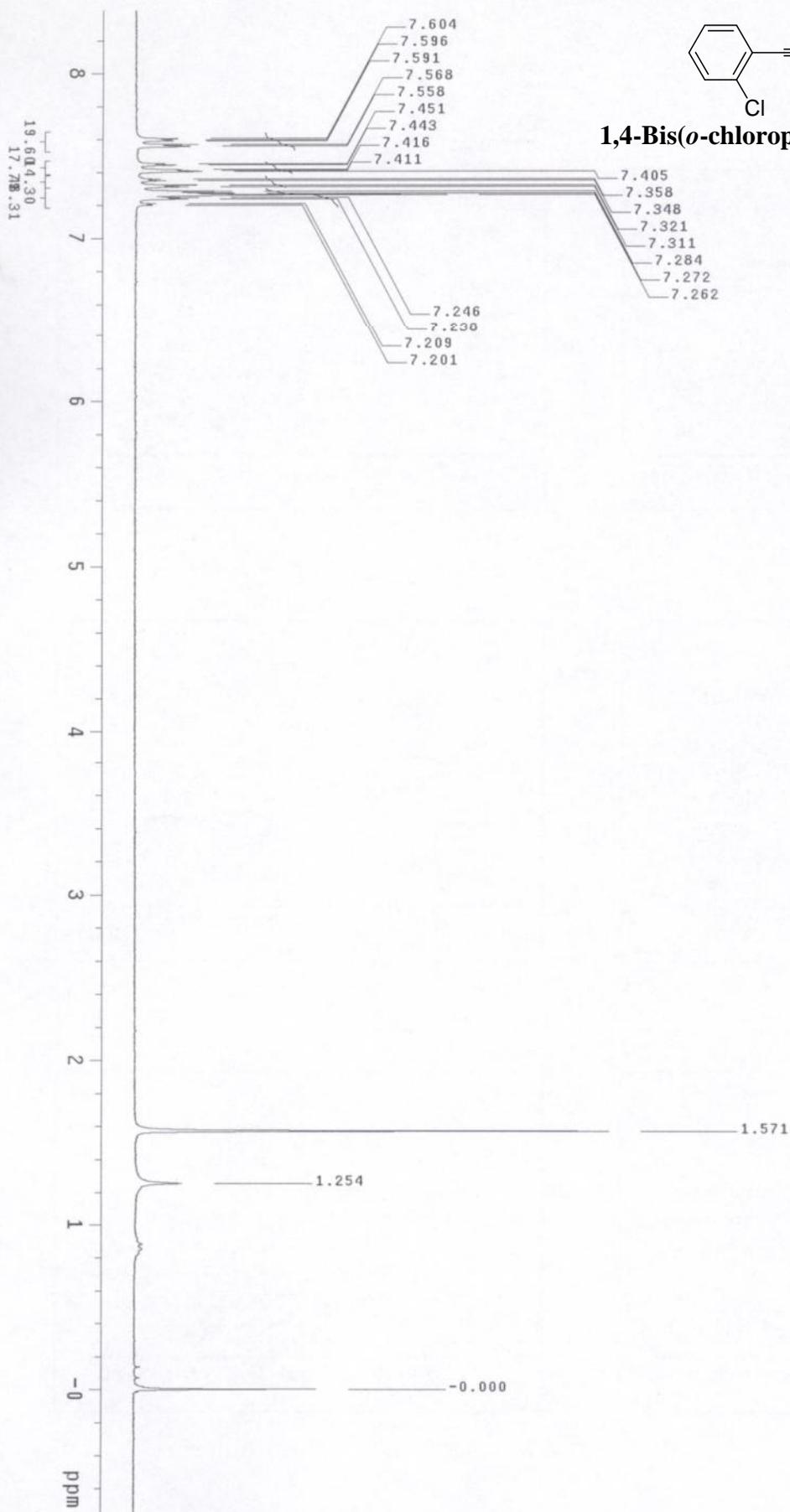
1,4-Bis(*p*-fluorophenyl) buta-1,3-diyne (3h)



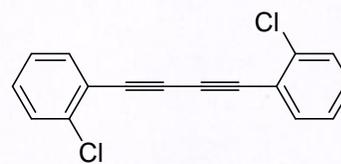
<sup>1</sup>H NMR



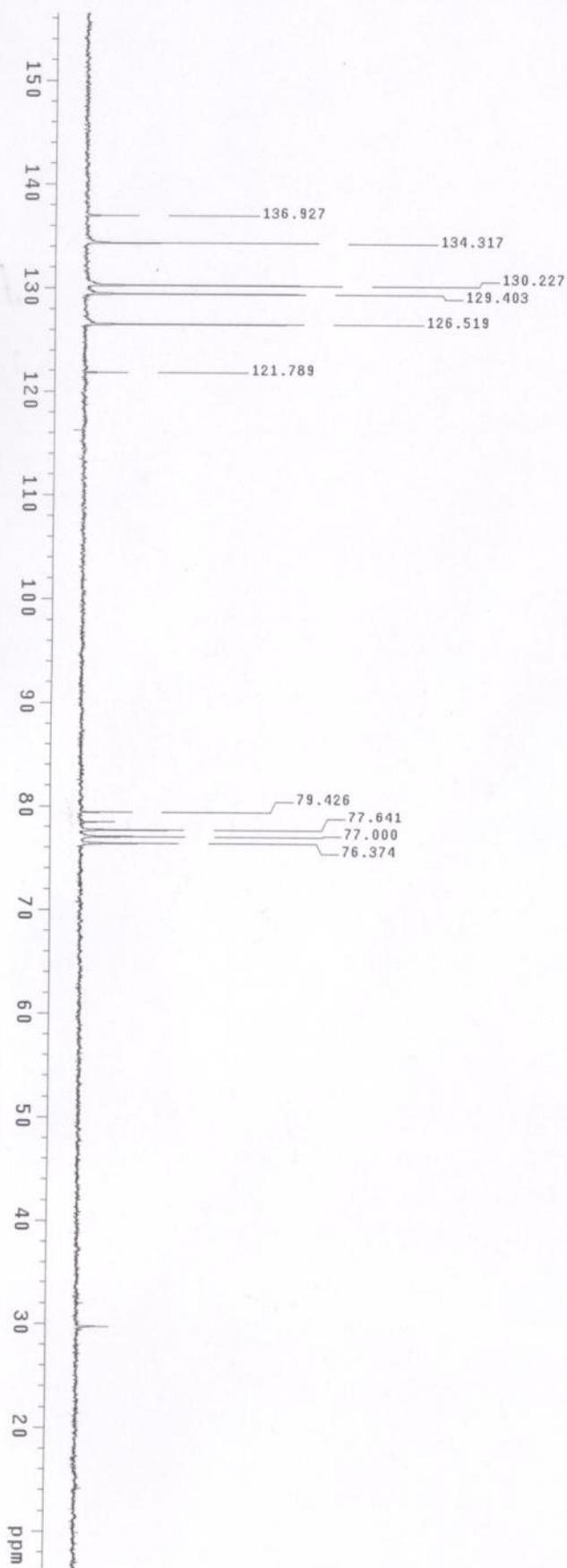
1,4-Bis(*o*-chlorophenyl) buta-1,3-diyne (3i)



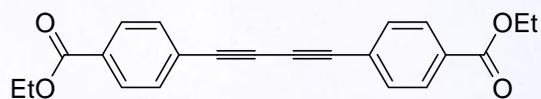
<sup>13</sup>C NMR



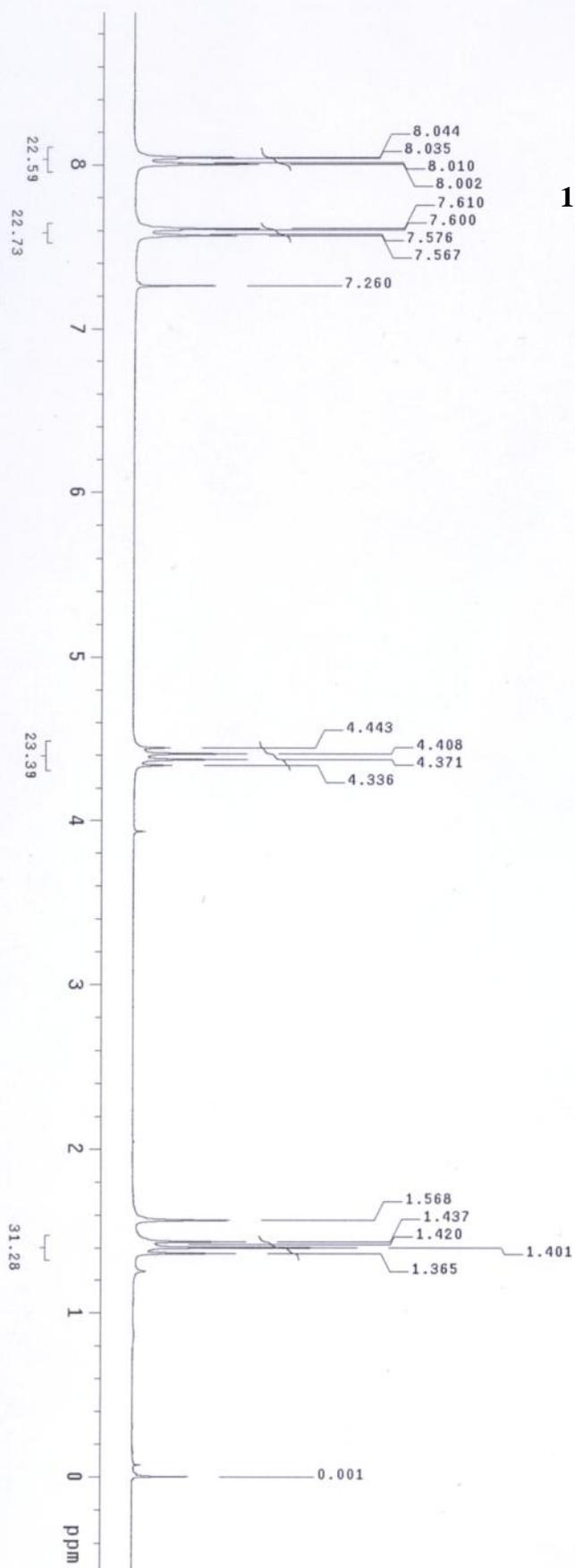
1,4-Bis(*o*-chlorophenyl) buta-1,3-diyne (3i)



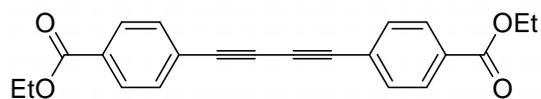
# <sup>1</sup>H NMR



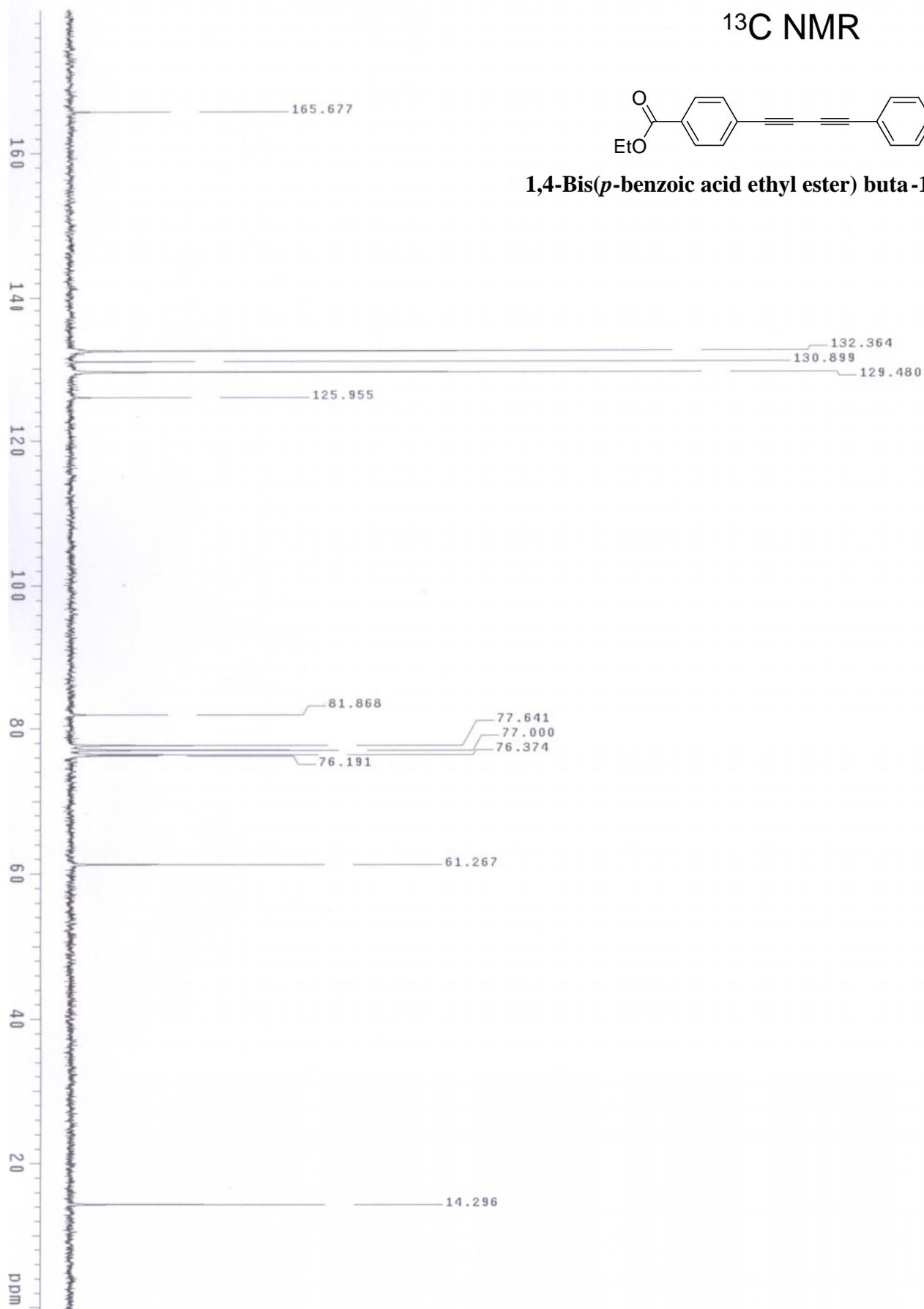
1,4-Bis(*p*-benzoic acid ethyl ester) buta-1,3-diyne (3j)



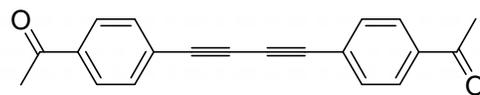
# <sup>13</sup>C NMR



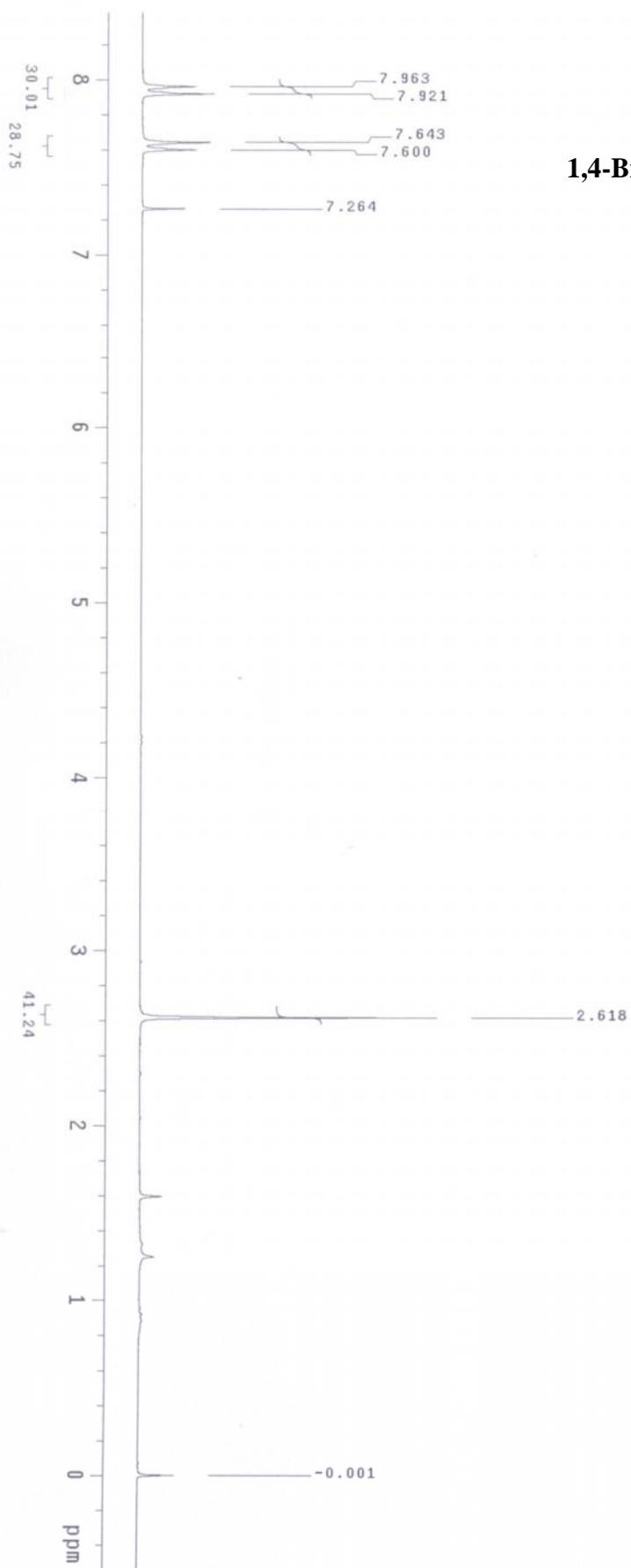
1,4-Bis(*p*-benzoic acid ethyl ester) buta-1,3-diyne (**3j**)<sup>6</sup>



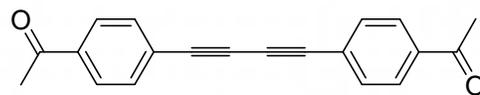
# <sup>1</sup>H NMR



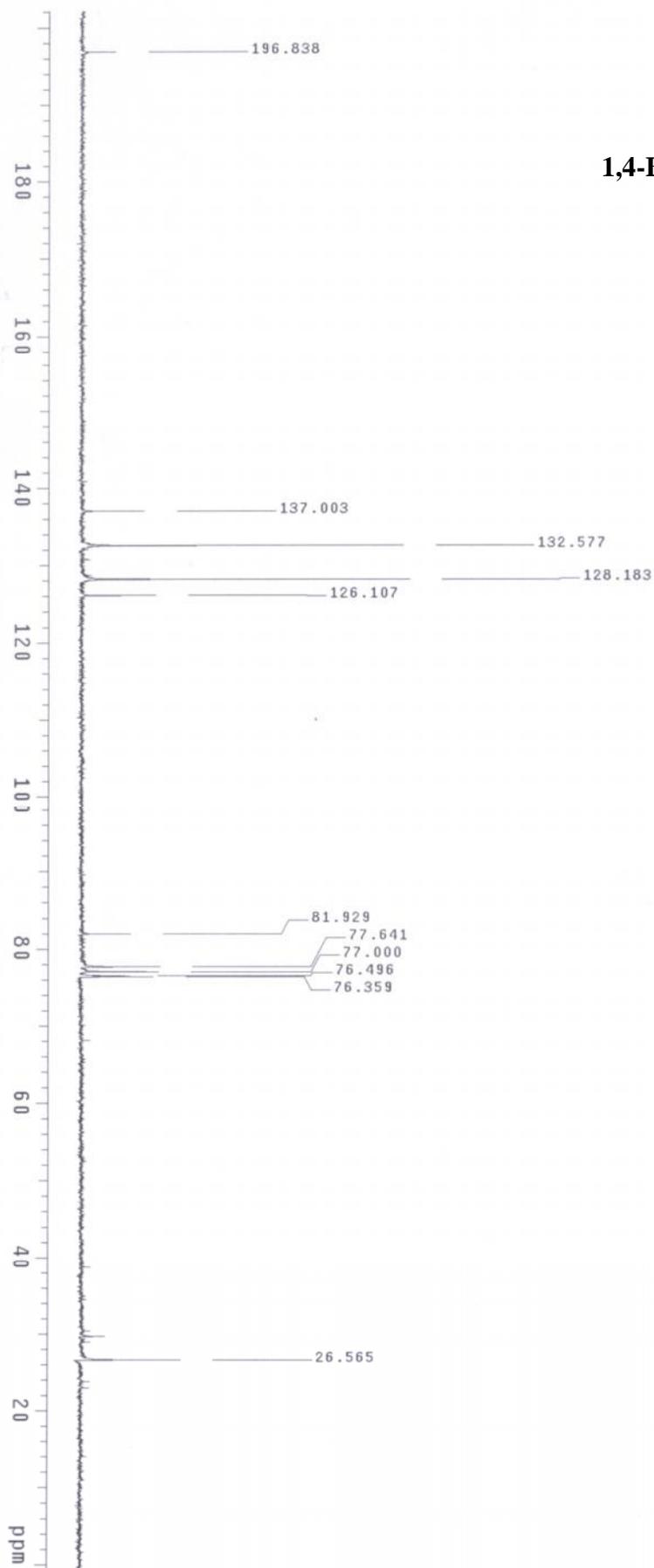
**1,4-Bis(*p*-acetylphenyl) buta-1,3-diyne (3k)**



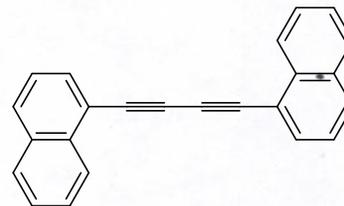
<sup>13</sup>C NMR



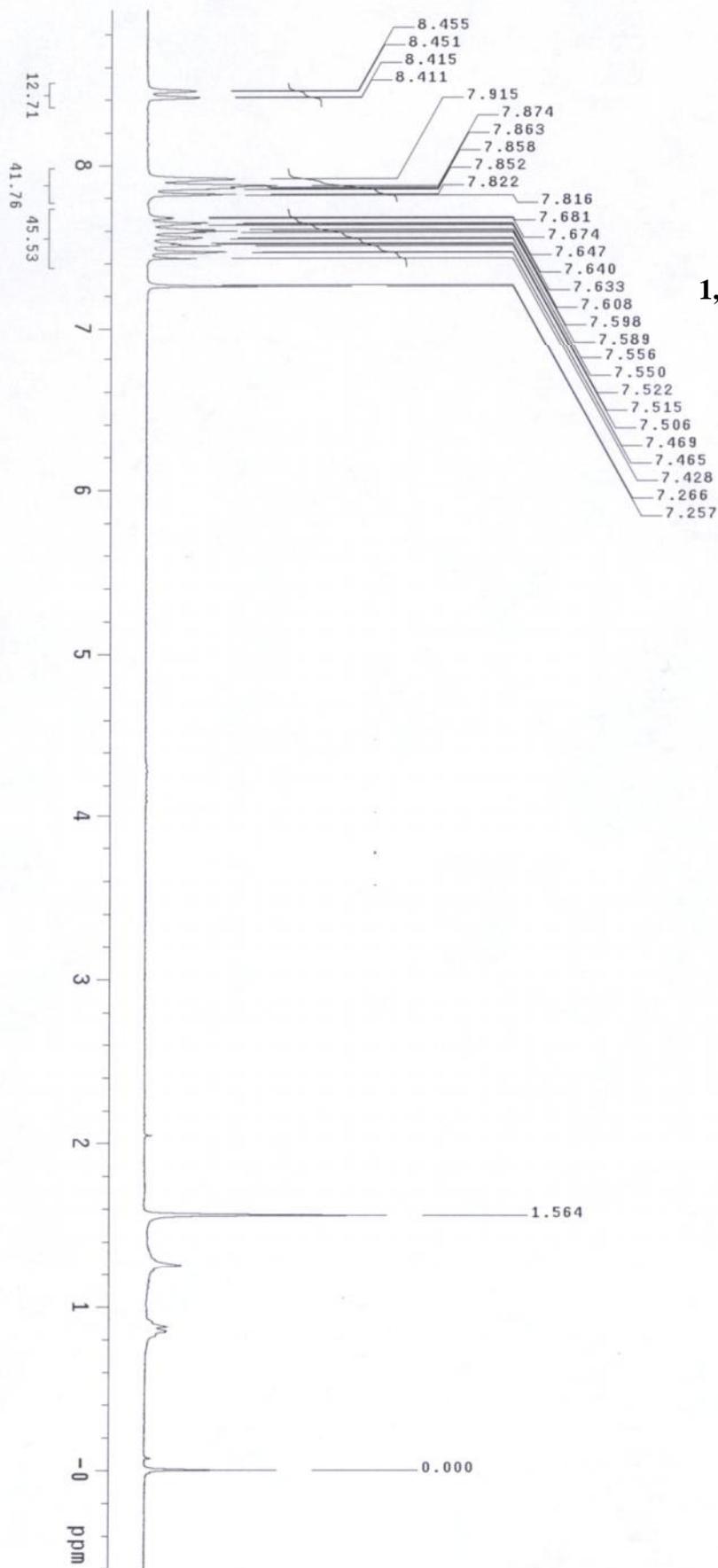
1,4-Bis(*p*-acetylphenyl) buta-1,3-diyne (3k)



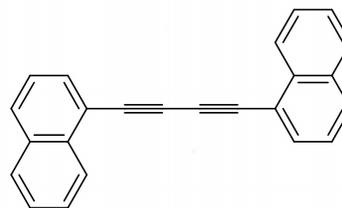
# <sup>1</sup>H NMR



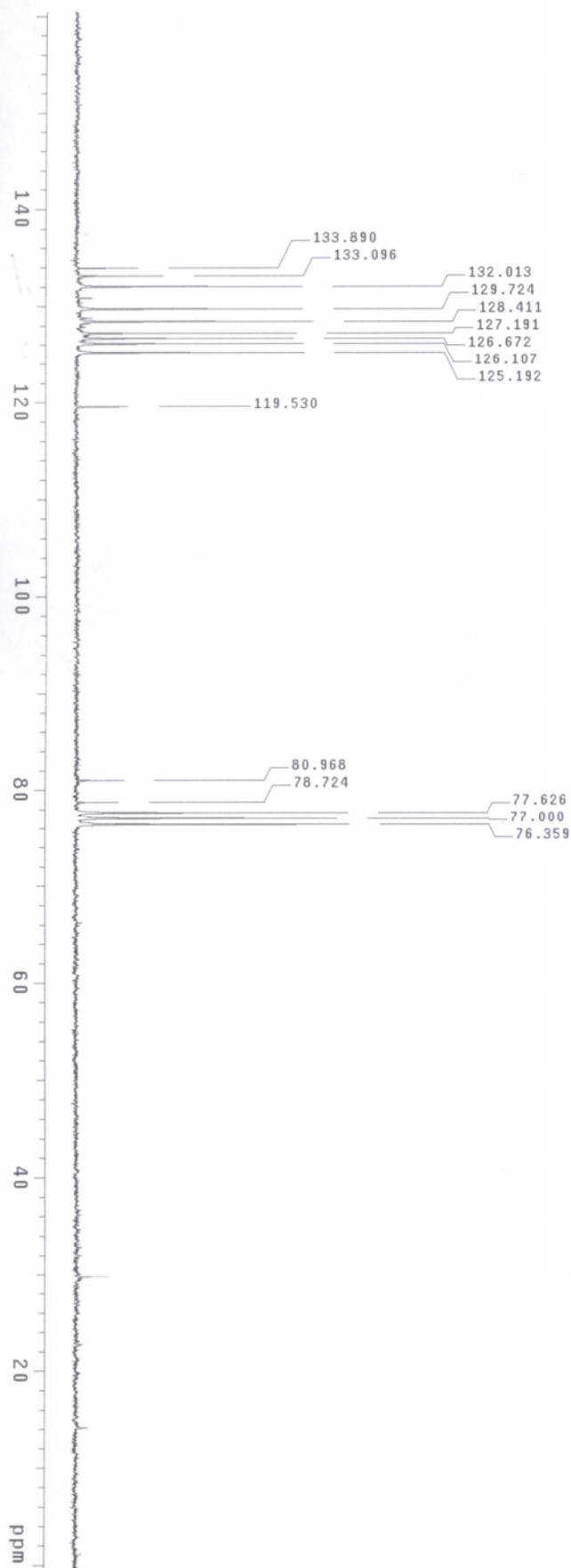
**1,4-Dinaphthyl-1,3-butadiyne (31)**



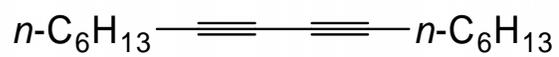
# <sup>13</sup>C NMR



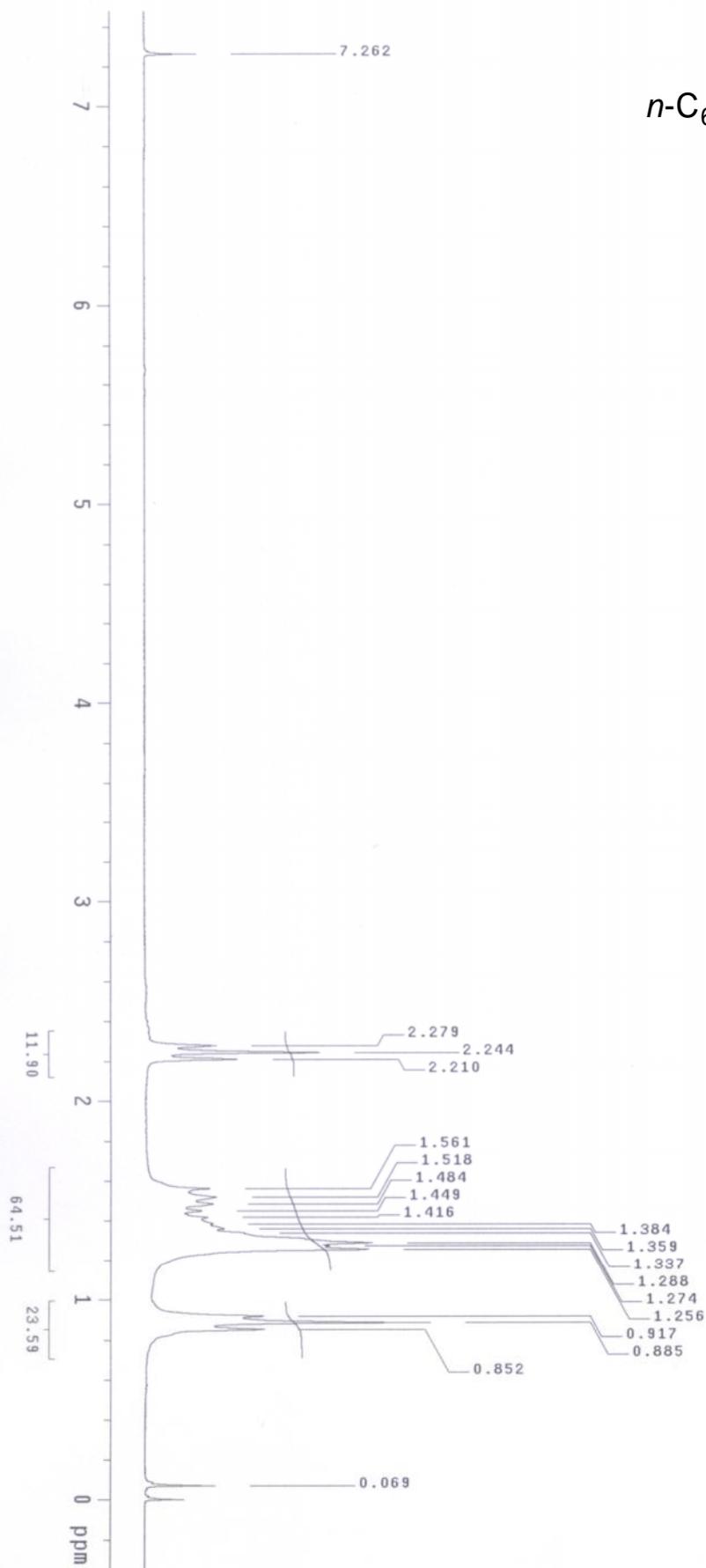
**1,4-Dinaphthyl-1,3-butadiyne (31)**



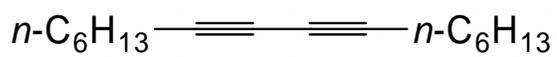
# $^1\text{H}$ NMR



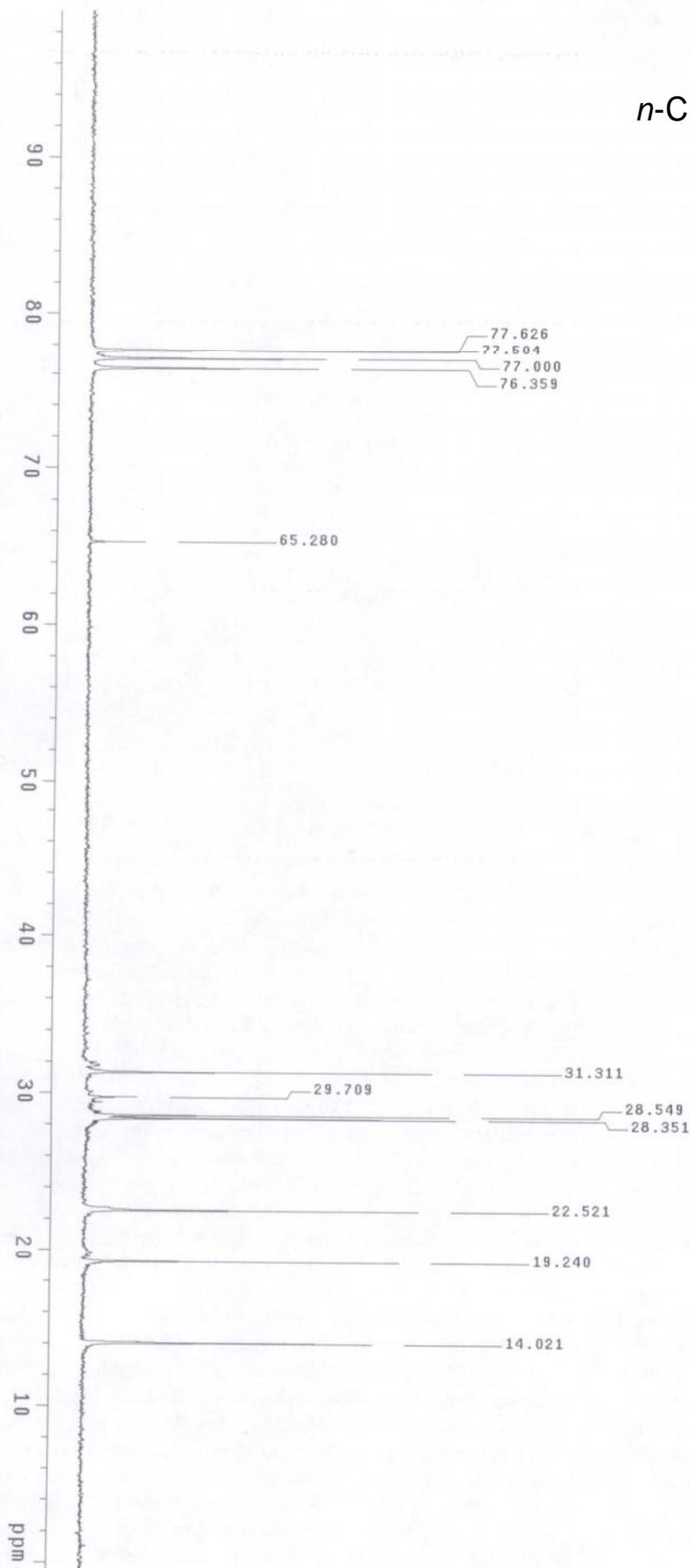
**Hexadeca-7,9-diyne (3m)**



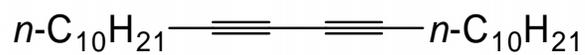
<sup>13</sup>C NMR



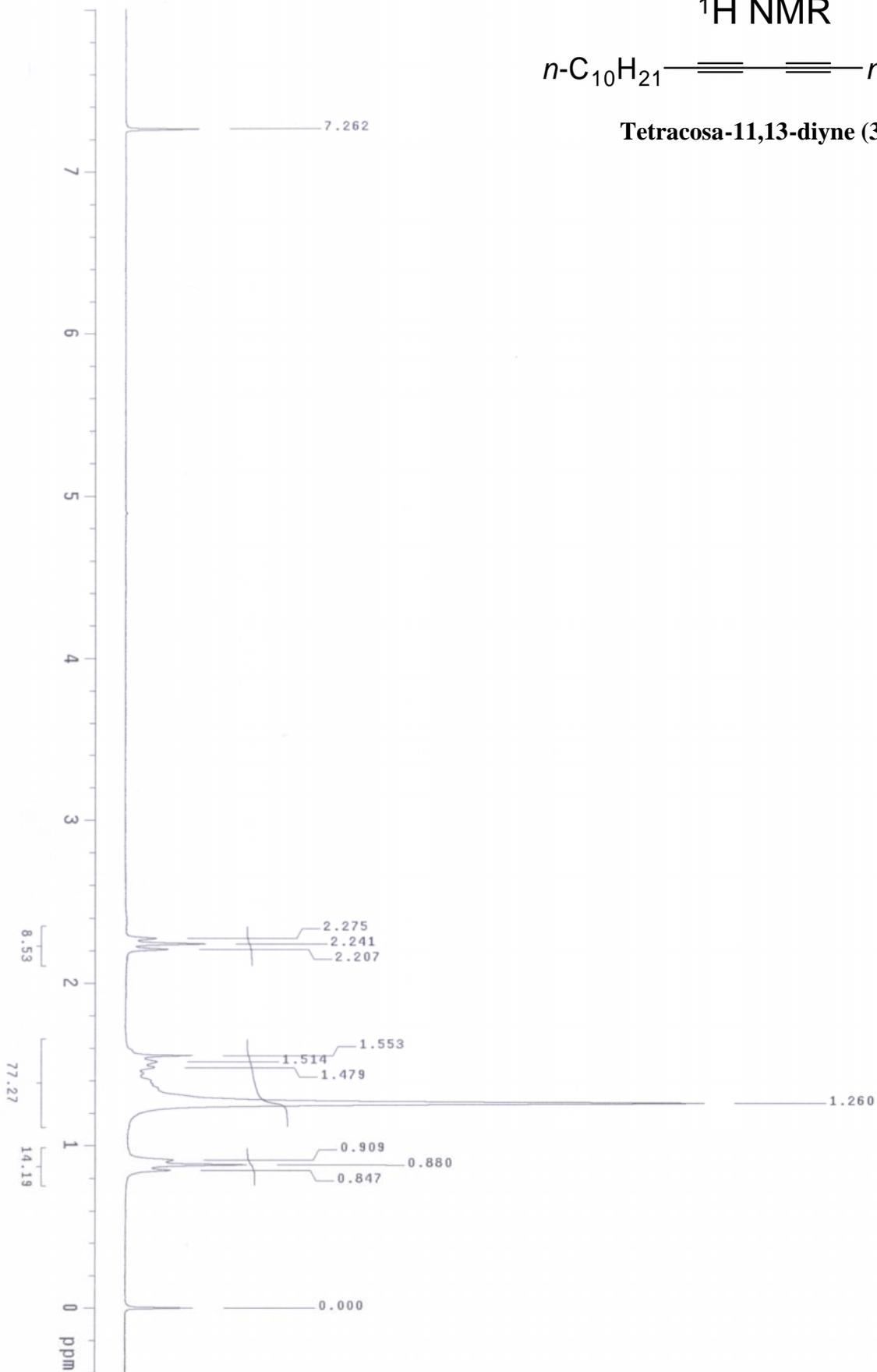
Hexadeca-7,9-diyne (3m)



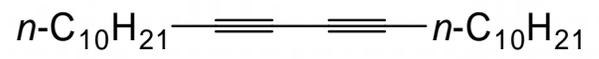
# $^1\text{H}$ NMR



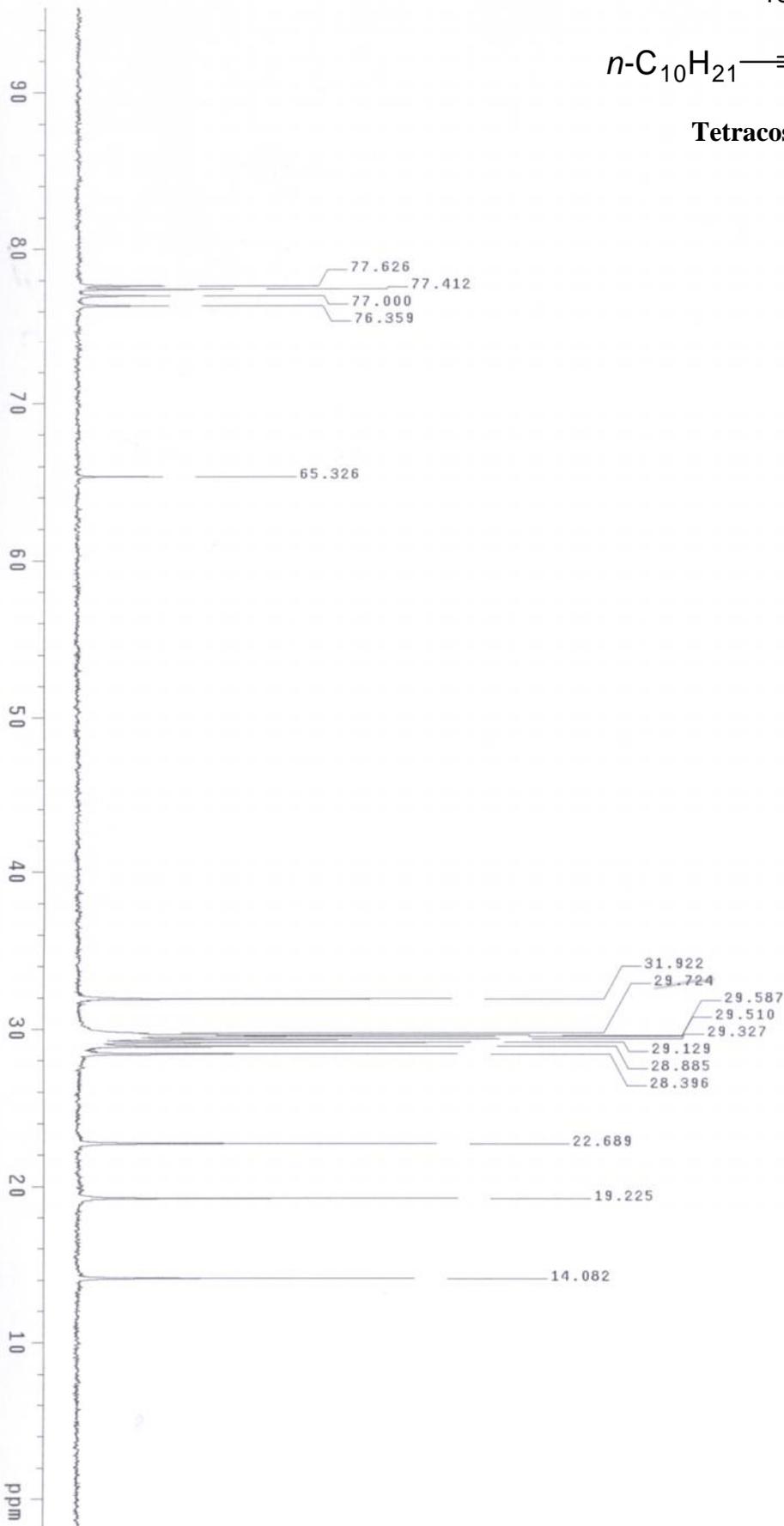
**Tetracos-11,13-diyne (3n)**



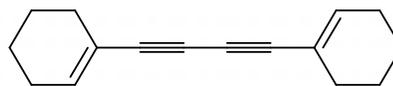
<sup>13</sup>C NMR



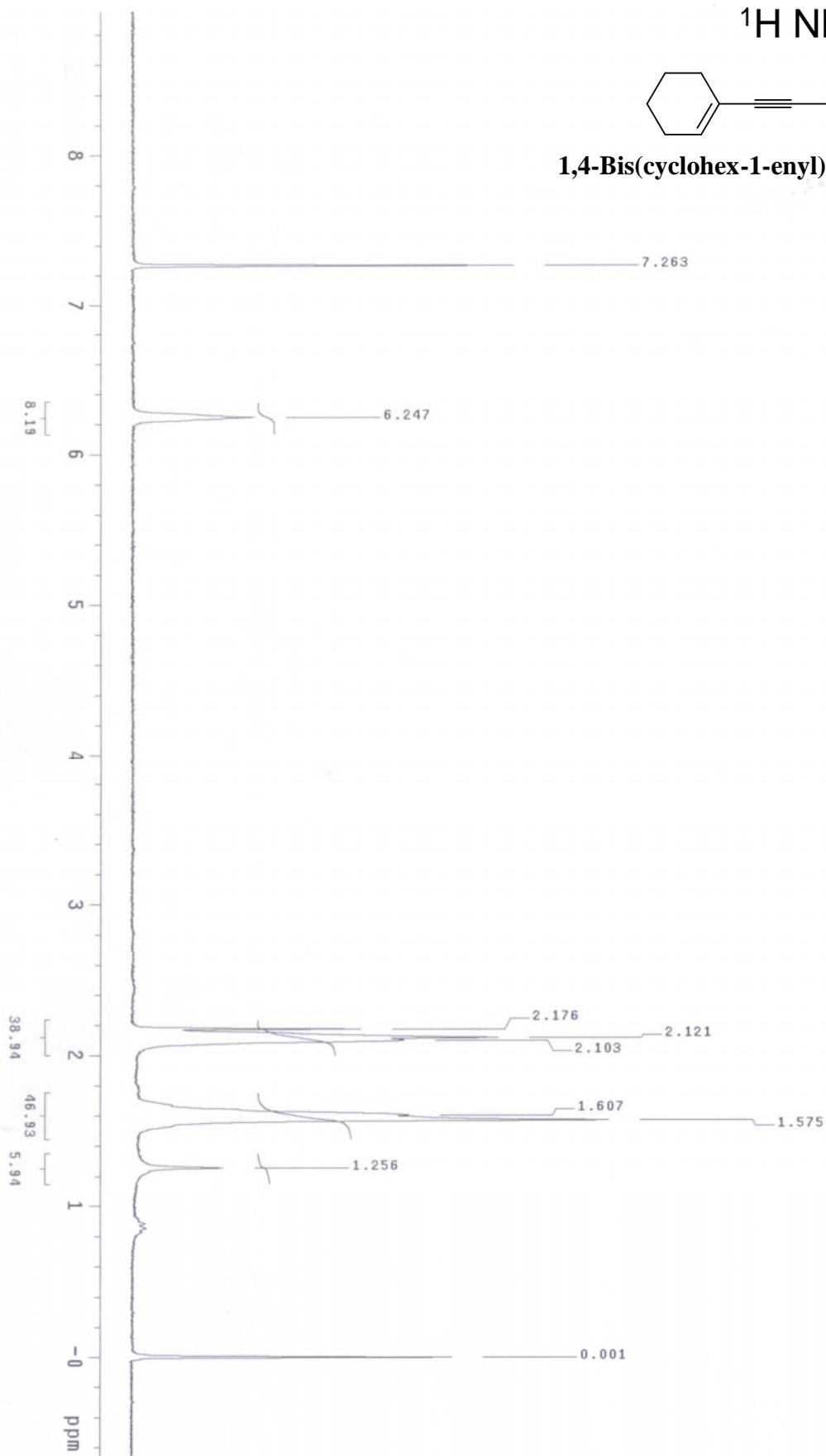
**Tetracos-11,13-diyne (3n)**



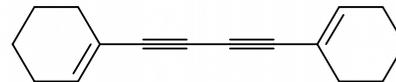
<sup>1</sup>H NMR



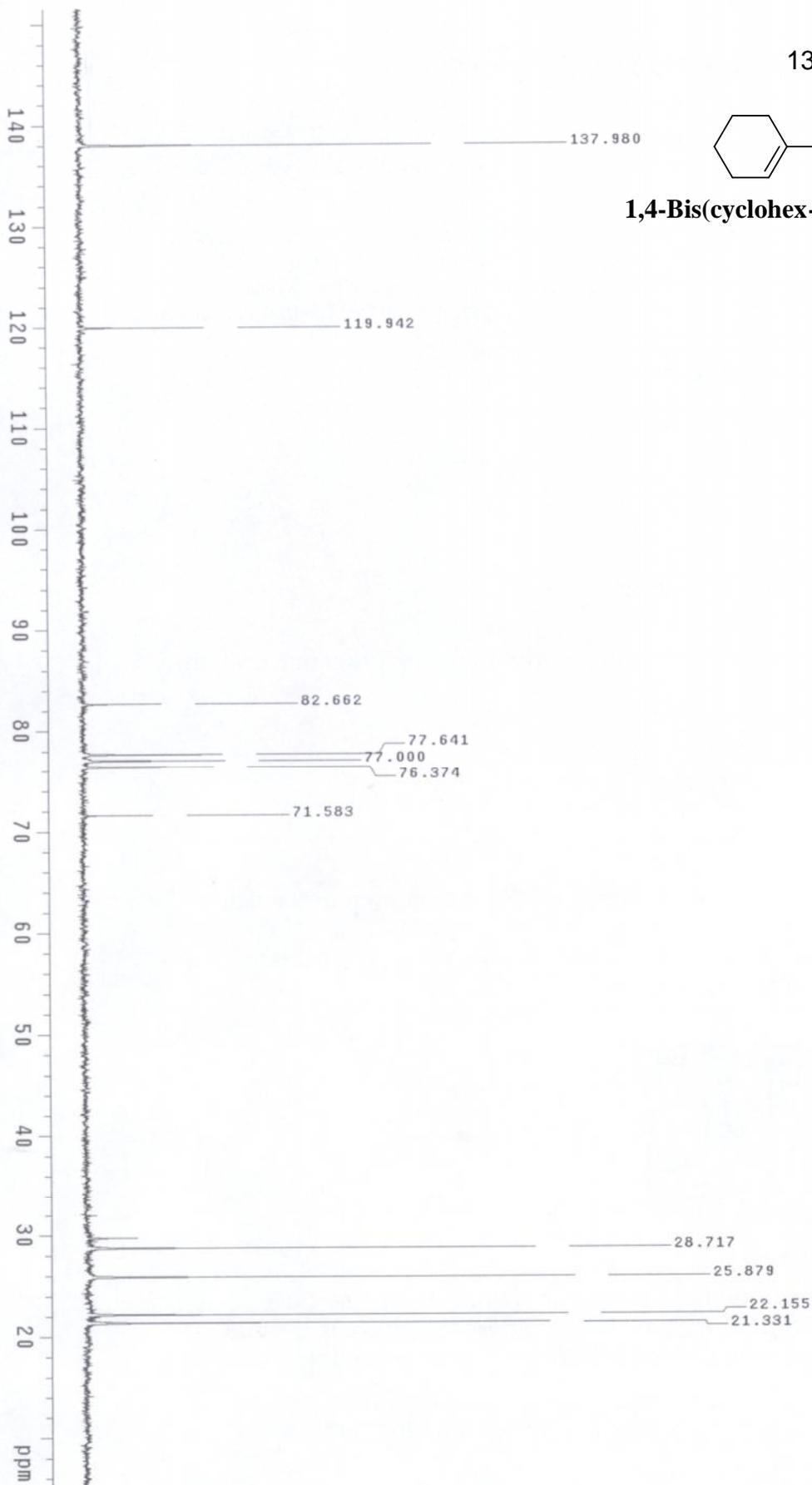
1,4-Bis(cyclohex-1-enyl) buta-1,3-diyne (30)



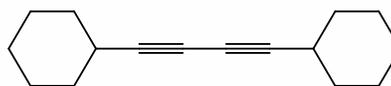
<sup>13</sup>C NMR



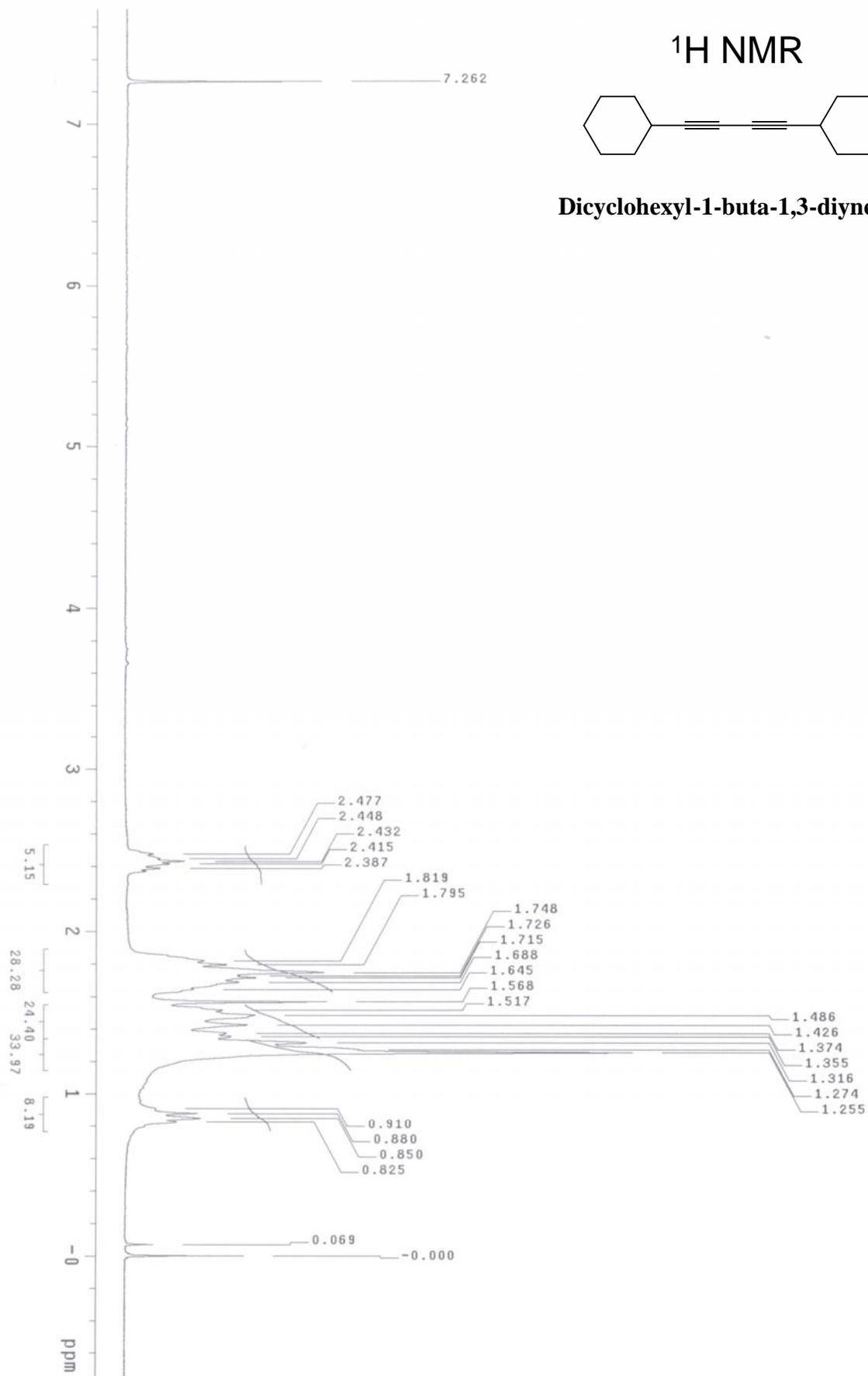
1,4-Bis(cyclohex-1-enyl) buta-1,3-diyne (30)



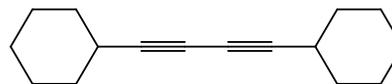
# <sup>1</sup>H NMR



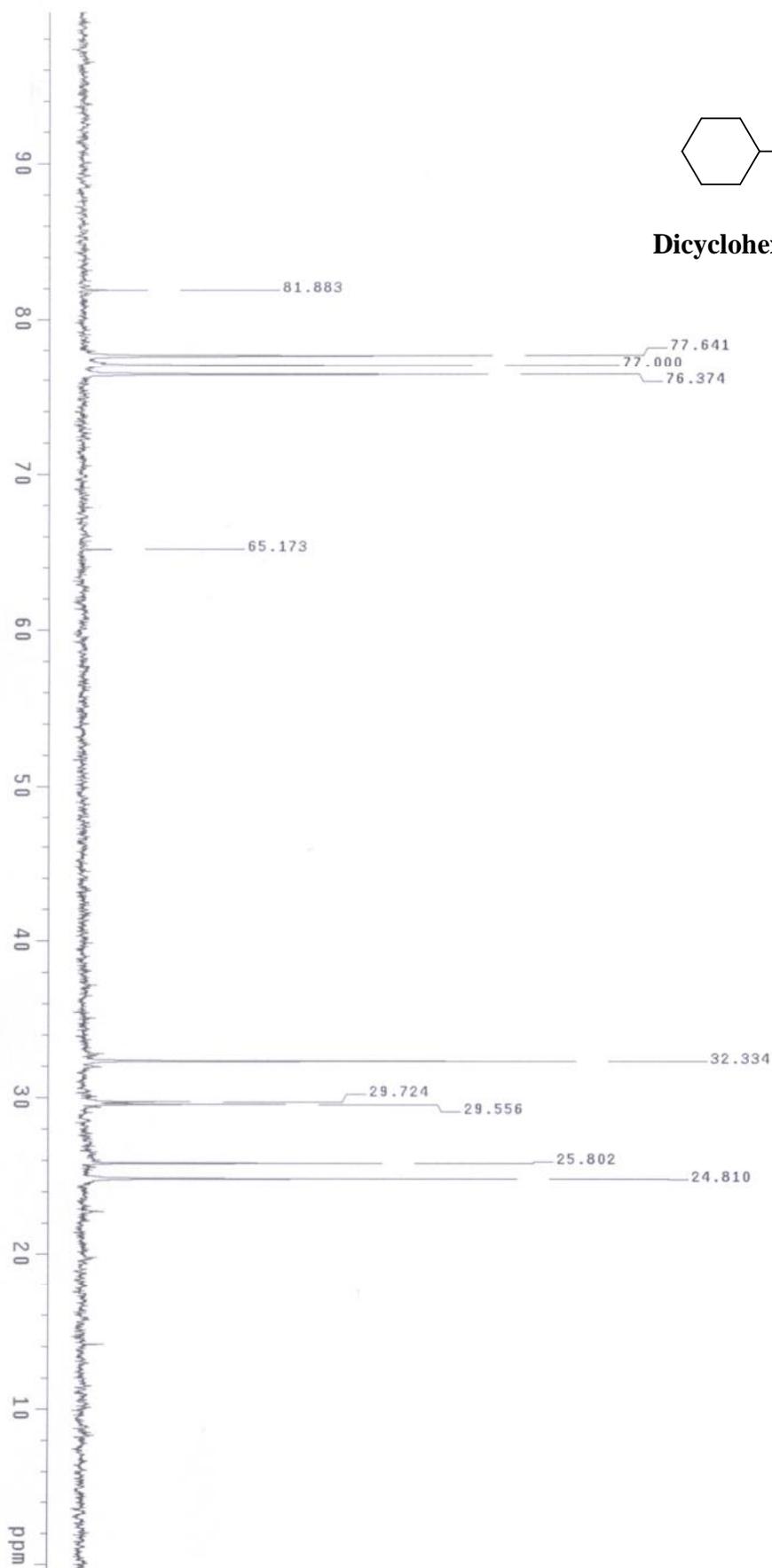
Dicyclohexyl-1-buta-1,3-diyne (3p)



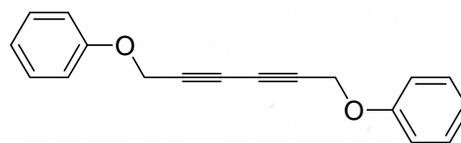
<sup>13</sup>C NMR



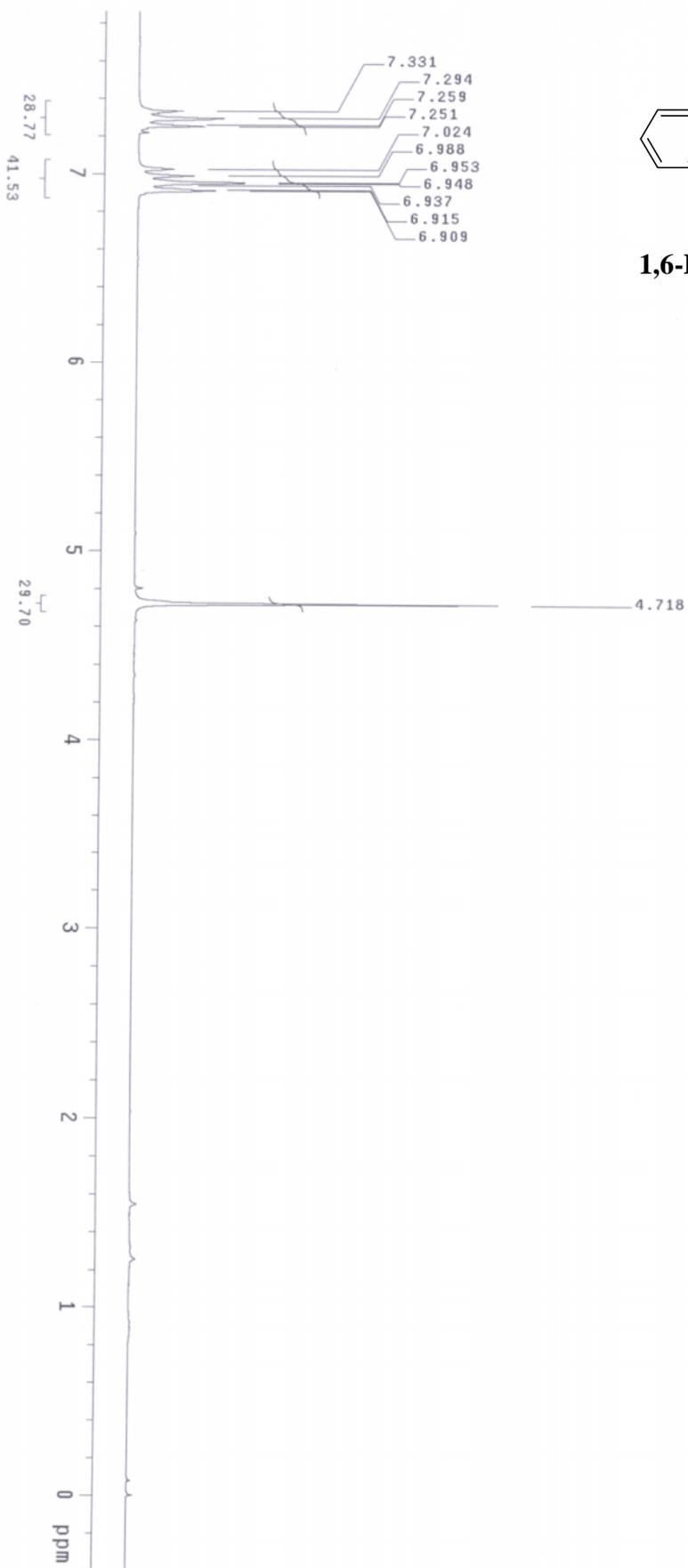
Dicyclohexyl-1-buta-1,3-diyne (3p)



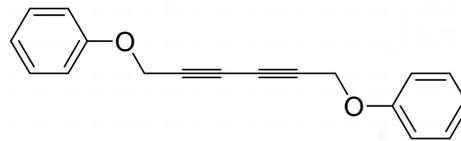
# <sup>1</sup>H NMR



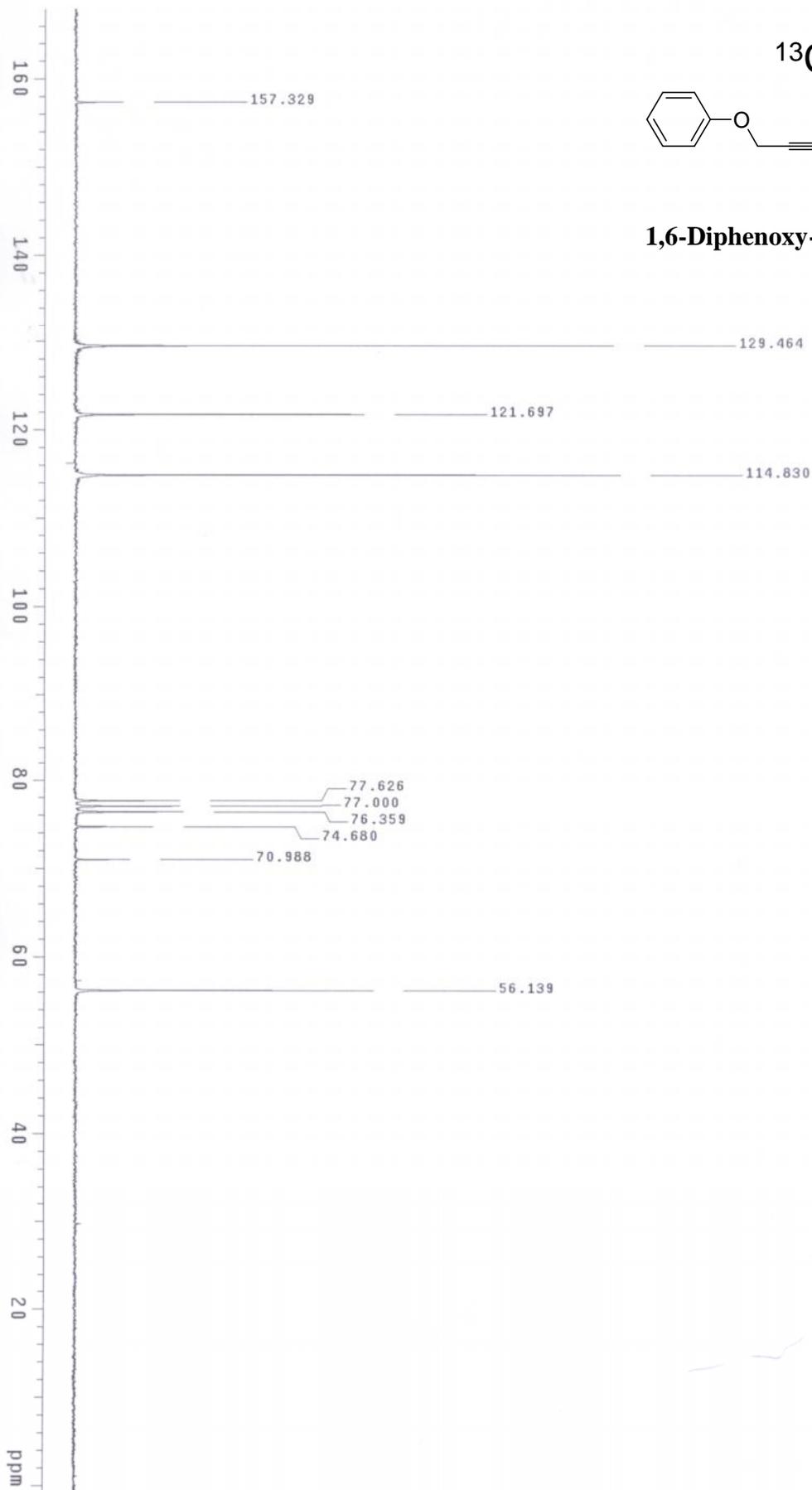
**1,6-Diphenoxy-2,4-hexadiyne (3q)**



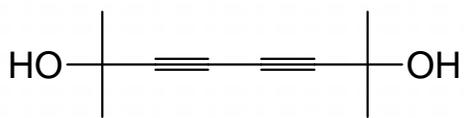
<sup>13</sup>C NMR



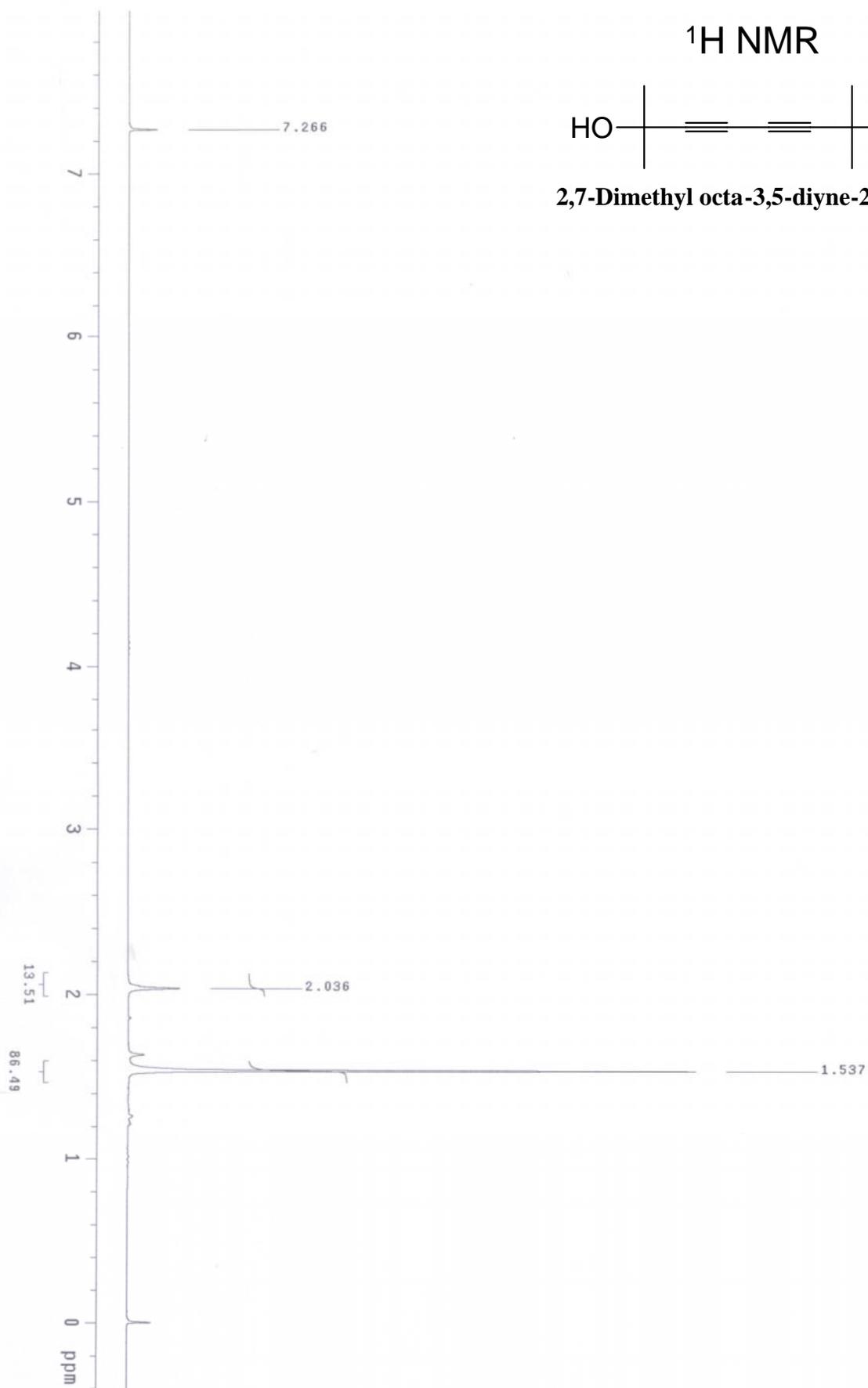
1,6-Diphenoxy-2,4-hexadiyne (3q)



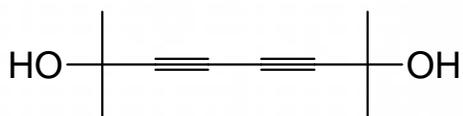
<sup>1</sup>H NMR



2,7-Dimethyl octa-3,5-diyne-2,7-diol (3r)



<sup>13</sup>C NMR



2,7-Dimethyl octa-3,5-diyne-2,7-diol (3r)

