

Synthesis and Characterization of Novel Dimeric s-Triazine Derivatives as Potential Anti-Bacterial Agents against MDR Clinical Isolates.

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S67	Figure 67: ^{13}C -NMR ($\text{DMSO}-d_6$) spectrum of (<i>N'E,N'''E,N''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(<i>N'</i> -(benzo[d][1,3]dioxol-5-ylmethylene)acetohydrazide) 19i .	67
S68	Figure 68: IR (KBr) spectrum of (<i>N'E,N'''E,N''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(<i>N'</i> -(furan-2-ylmethylene)acetohydrazide) 19j .	68
S69	Figure 69: ^1H -NMR ($\text{DMSO}-d_6$) spectrum of (<i>N'E,N'''E,N''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(<i>N'</i> -(furan-2-ylmethylene)acetohydrazide) 19j .	69
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S71	Figure 71: ^{13}C -NMR (DMSO- d_6) spectrum of (<i>N'E,N'''E,N'''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(N'-(furan-2-ylmethylene)acetohydrazide) 19j .	71
S72	Figure 72: IR (KBr) spectrum of (<i>N'E,N'''E,N'''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(N'-benzylideneacetohydrazide) 20a .	72
S73	Figure 73: ^1H -NMR (DMSO- d_6) spectrum of (<i>N'E,N'''E,N'''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(N'-benzylideneacetohydrazide) 20a .	73
S74	Figure 74: ^{13}C -NMR (DMSO- d_6) spectrum of (<i>N'E,N'''E,N'''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(N'-benzylideneacetohydrazide) 20a .	74
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S76	Figure 76: ^1H -NMR (DMSO- d_6) spectrum of (<i>N'E,N'''E,N'''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(N'-(4-methylbenzylidene)acetohydrazide) 20b .	76
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S78	Figure 78: ^{13}C -NMR (DMSO- d_6) spectrum of (<i>N'E,N'''E,N'''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(N'-(4-methylbenzylidene)acetohydrazide) 20b .	78
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S84	Figure 84: ^1H -NMR ($\text{DMSO}-d_6$) spectrum of (<i>N'E,N'''E,N''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(<i>N'</i> -(4-chlorobenzylidene)acetohydrazide) 20d .	84
S85	Figure 85: ^1H -NMR ($\text{DMSO}-d_6\text{D}_2\text{O}$) spectrum of (<i>N'E,N'''E,N''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(<i>N'</i> -(4-chlorobenzylidene)acetohydrazide) 20d .	85
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S92	Figure 92: ^{13}C -NMR ($\text{DMSO}-d_6$) spectrum of (<i>N'E,N'''E,N''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(<i>N'</i> -(4-fluorobenzylidene)acetohydrazide) 20f .	92
S93	Figure 93: IR (KBr) spectrum of (<i>N'E,N'''E,N''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(<i>N'</i> -(4-hydroxybenzylidene)acetohydrazide) 20g .	93
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S96	Figure 96: IR (KBr) spectrum of (<i>N'E,N'''E,N''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(<i>N'</i> -(3,4-dimethoxybenzylidene)acetohydrazide) 20h .	96

S97	Figure 97: ^1H -NMR ($\text{DMSO-}d_6$) spectrum of (<i>N'E,N'''E,N''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(<i>N'</i> -(3,4-dimethoxybenzylidene)acetohydrazide) 20h .	97
S98	Figure 98: IR (KBr) spectrum of (<i>N'E,N'''E,N''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(<i>N'</i> -(benzo[d][1,3]dioxol-5-ylmethylene)acetohydrazide) 20i .	98
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S100	Figure 100: ^{13}C -NMR ($\text{DMSO-}d_6$) spectrum of (<i>N'E,N'''E,N''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(<i>N'</i> -(benzo[d][1,3]dioxol-5-ylmethylene)acetohydrazide) 20i .	100
S101	Figure 101: IR (KBr) spectrum of (<i>N'E,N'''E,N''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(<i>N'</i> -(furan-2-ylmethylene)acetohydrazide) 20j .	101
S102	Figure 102: ^1H -NMR ($\text{DMSO-}d_6$) spectrum of (<i>N'E,N'''E,N''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(<i>N'</i> -(furan-2-ylmethylene)acetohydrazide) 20j .	102
S103	Figure 103: ^{13}C -NMR ($\text{DMSO-}d_6$) spectrum of (<i>N'E,N'''E,N''''E,N''''''E</i>)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(<i>N'</i> -(furan-2-ylmethylene)acetohydrazide) 20j .	103

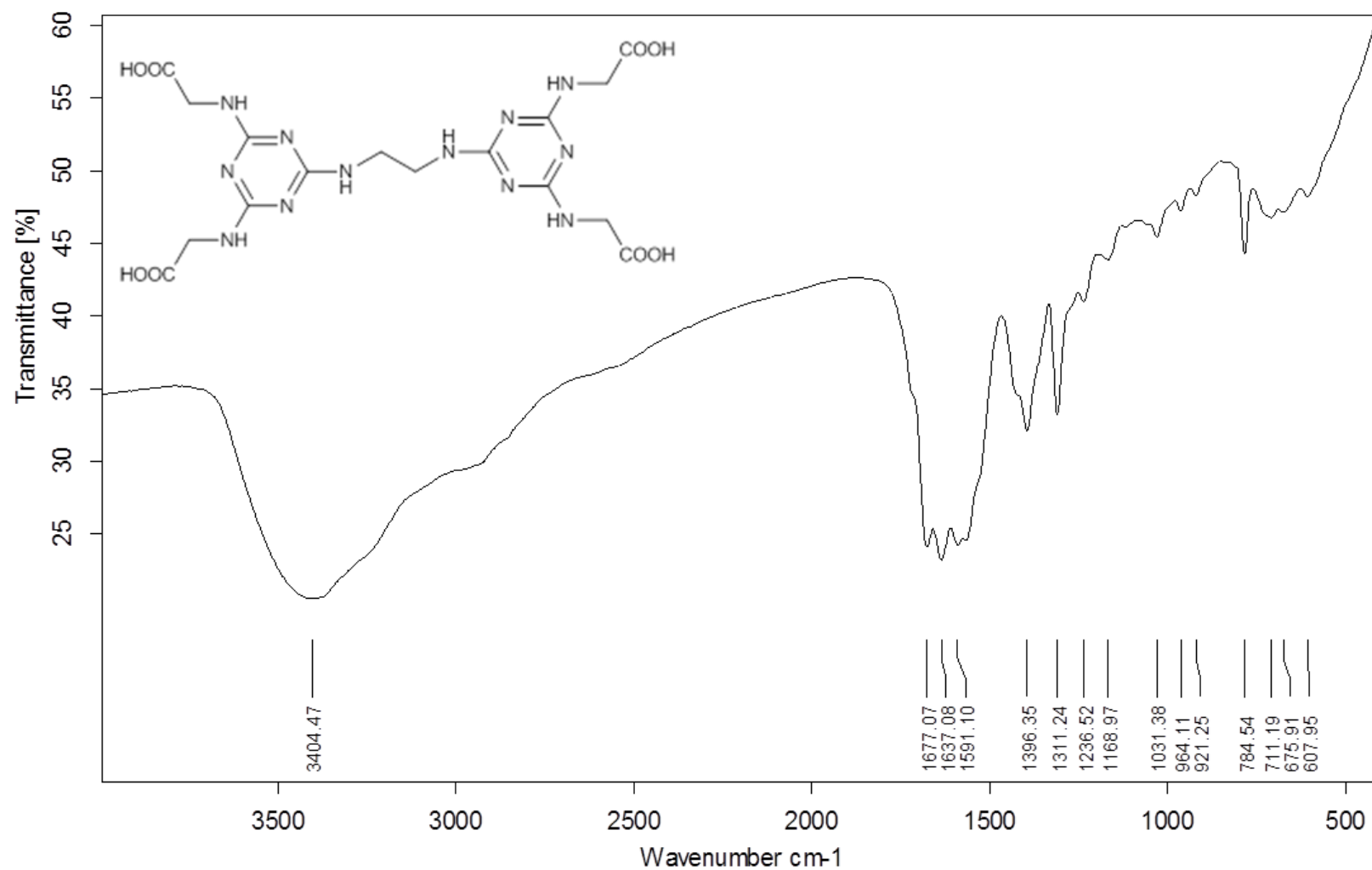


Figure 1: IR (KBr) spectrum of 2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetraacetic acid **6**.

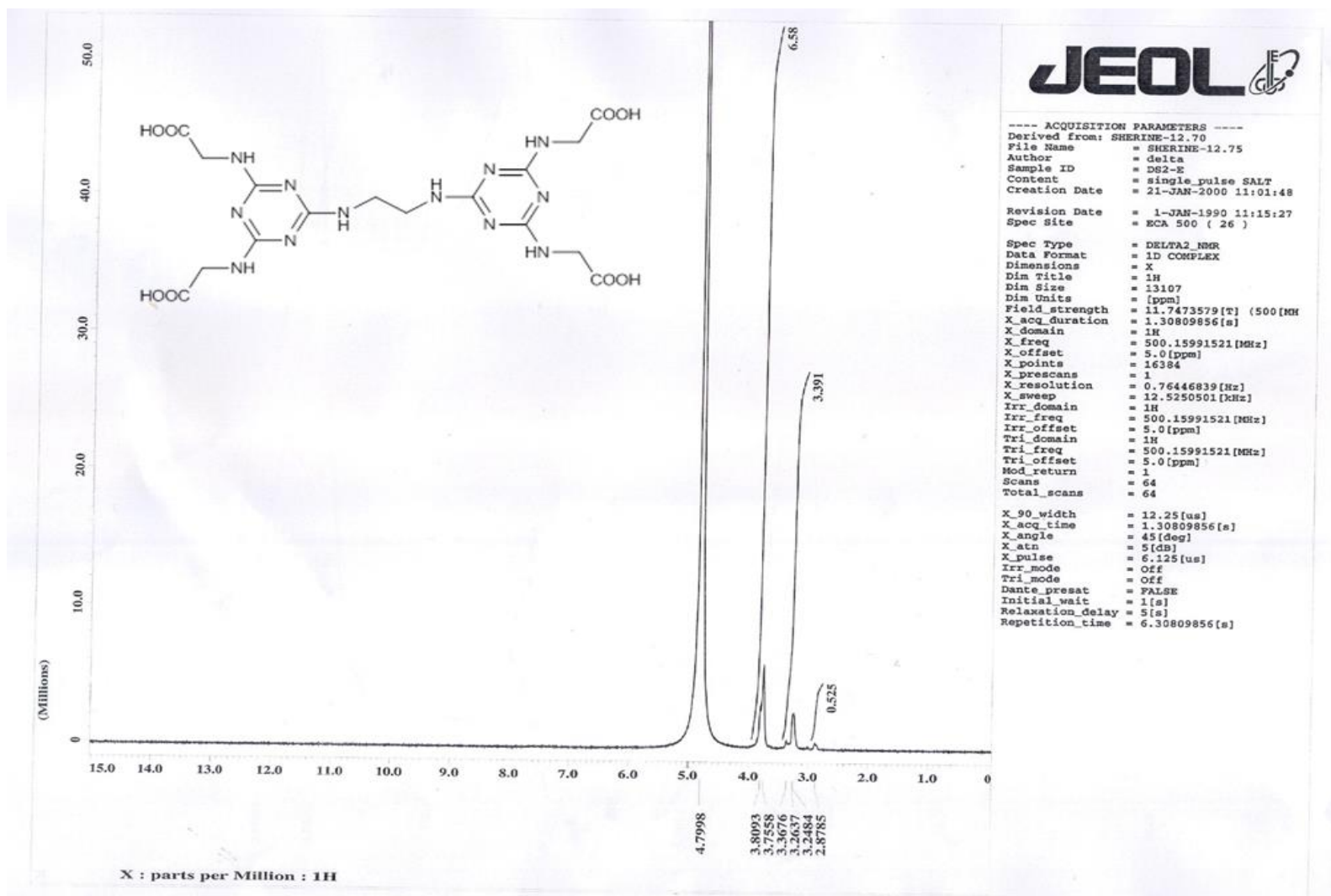


Figure 2: ^1H -NMR ($\text{DMSO-}d_6$ D_2O) spectrum of 2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetraacetic acid **6**.

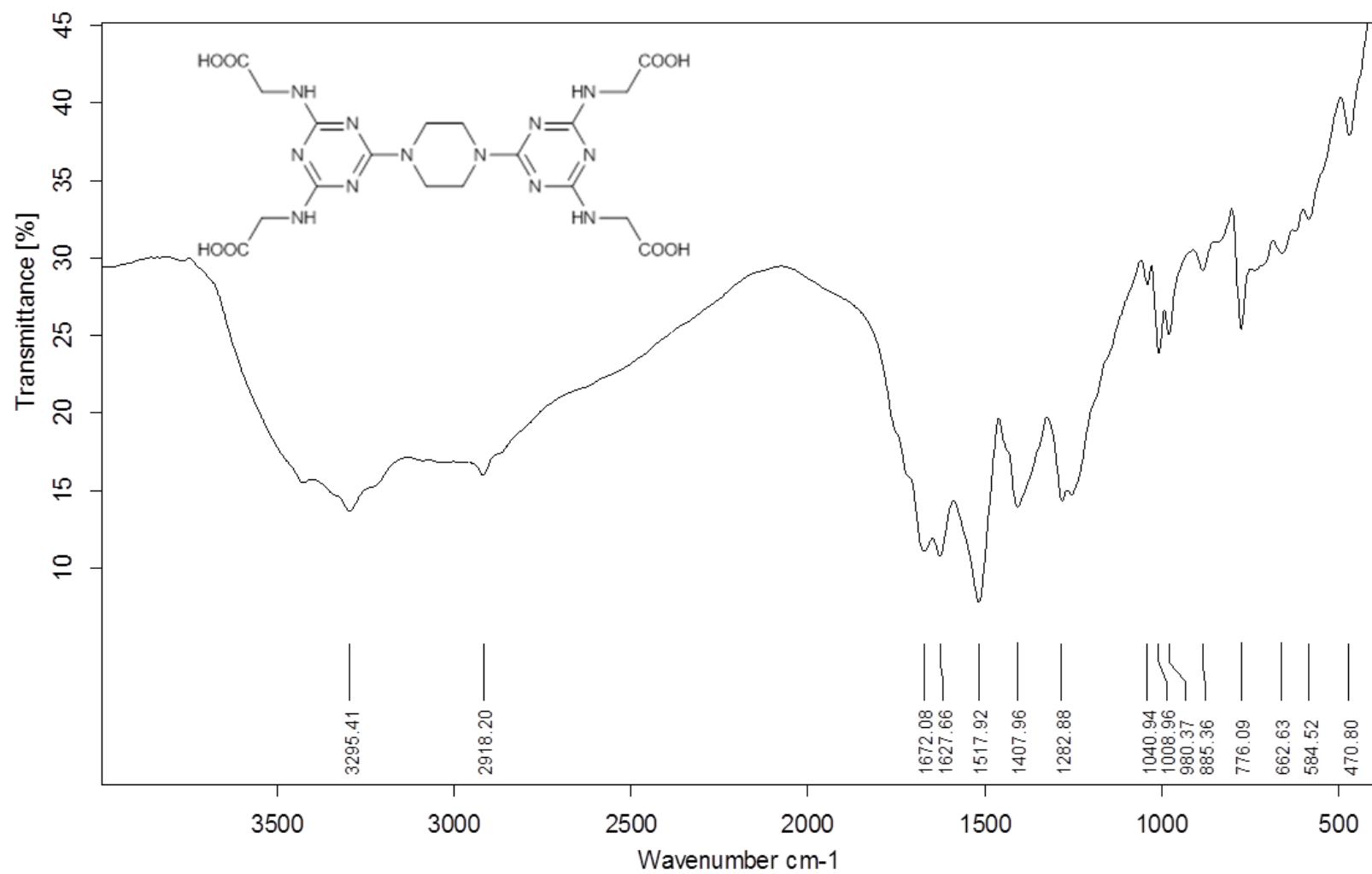


Figure 3: IR (KBr) spectrum of 2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetraacetic acid 7.

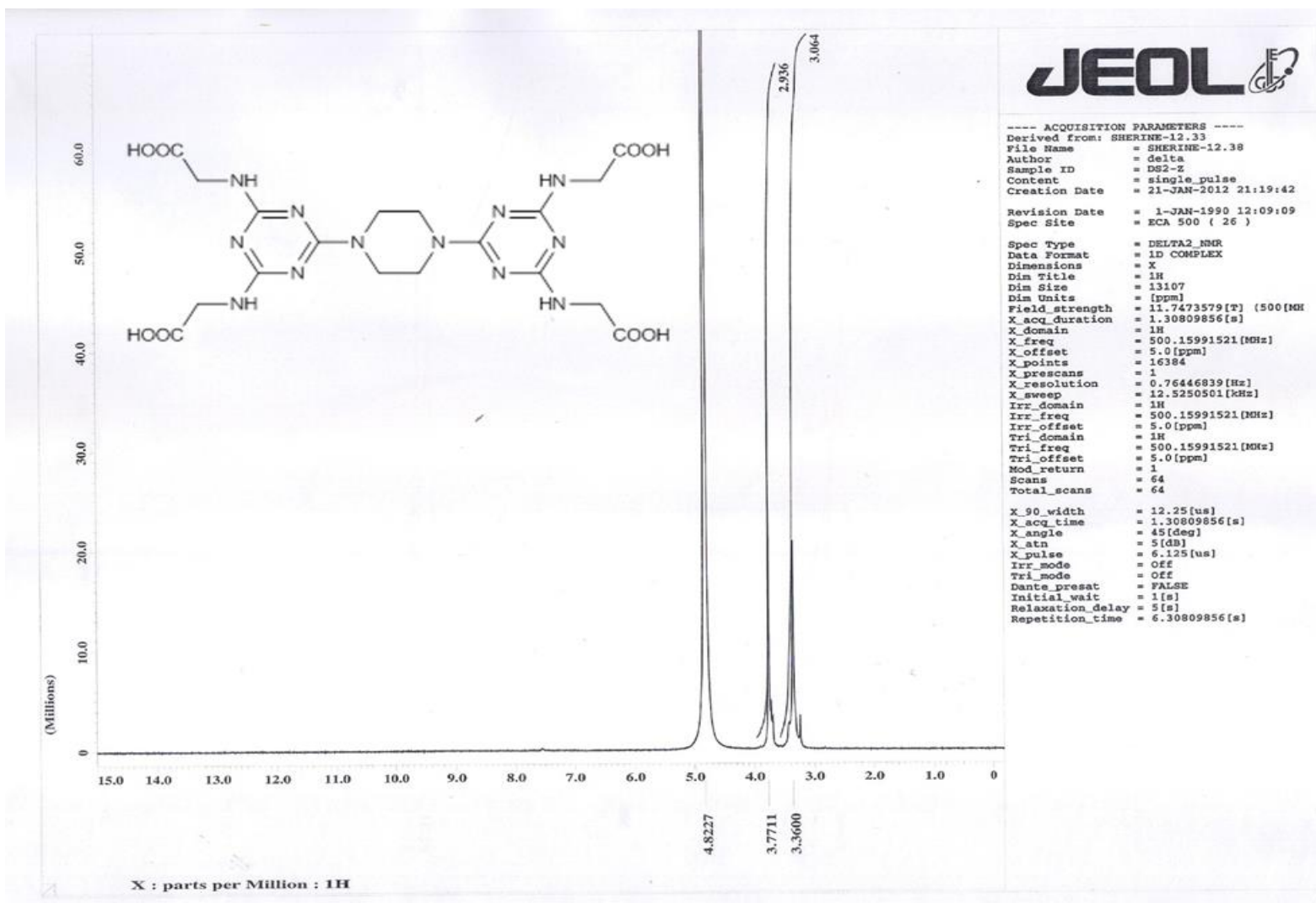


Figure 4: ¹H-NMR (DMSO-*d*₆ D₂O) spectrum of 2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetraacetic acid **7**.

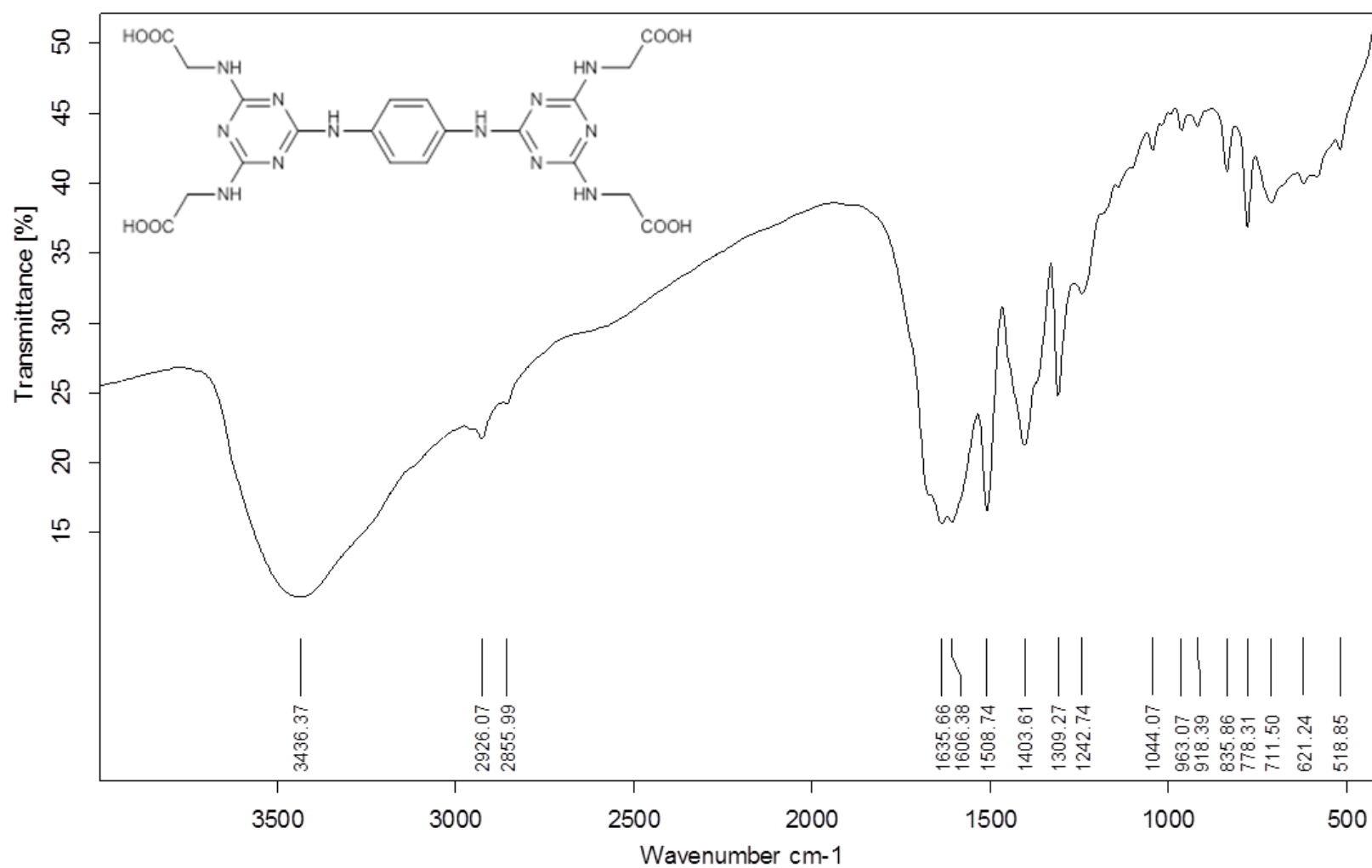


Figure 5: IR (KBr) spectrum of 2,2',2'',2'''-((6,6'-(1,4-phenylenebis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetraacetic acid **8**.

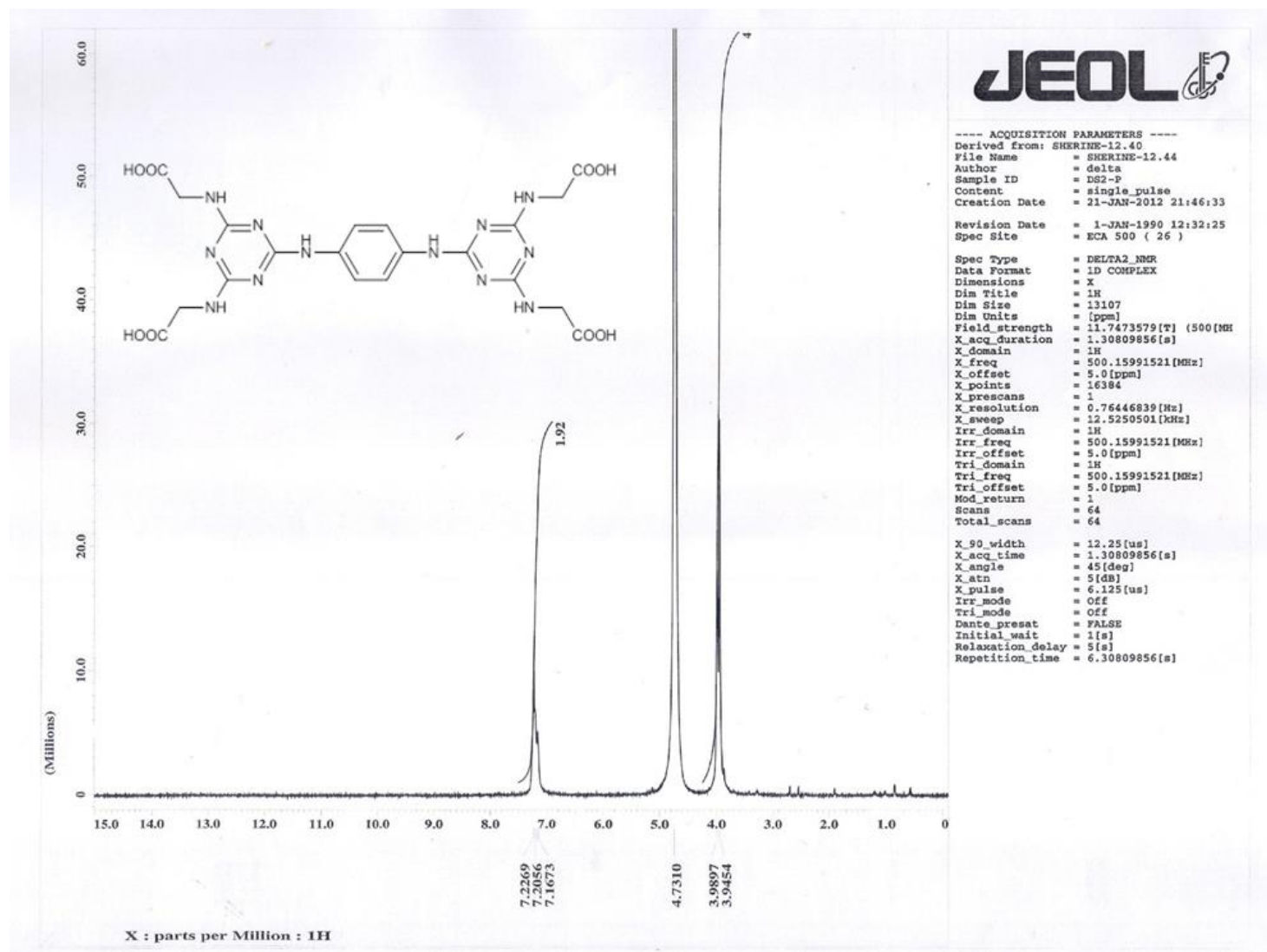


Figure 6: ¹H-NMR (DMSO-*d*₆ D₂O) spectrum of 2,2',2'',2'''-((6,6'-(1,4-phenylenebis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetraacetic acid **8**.

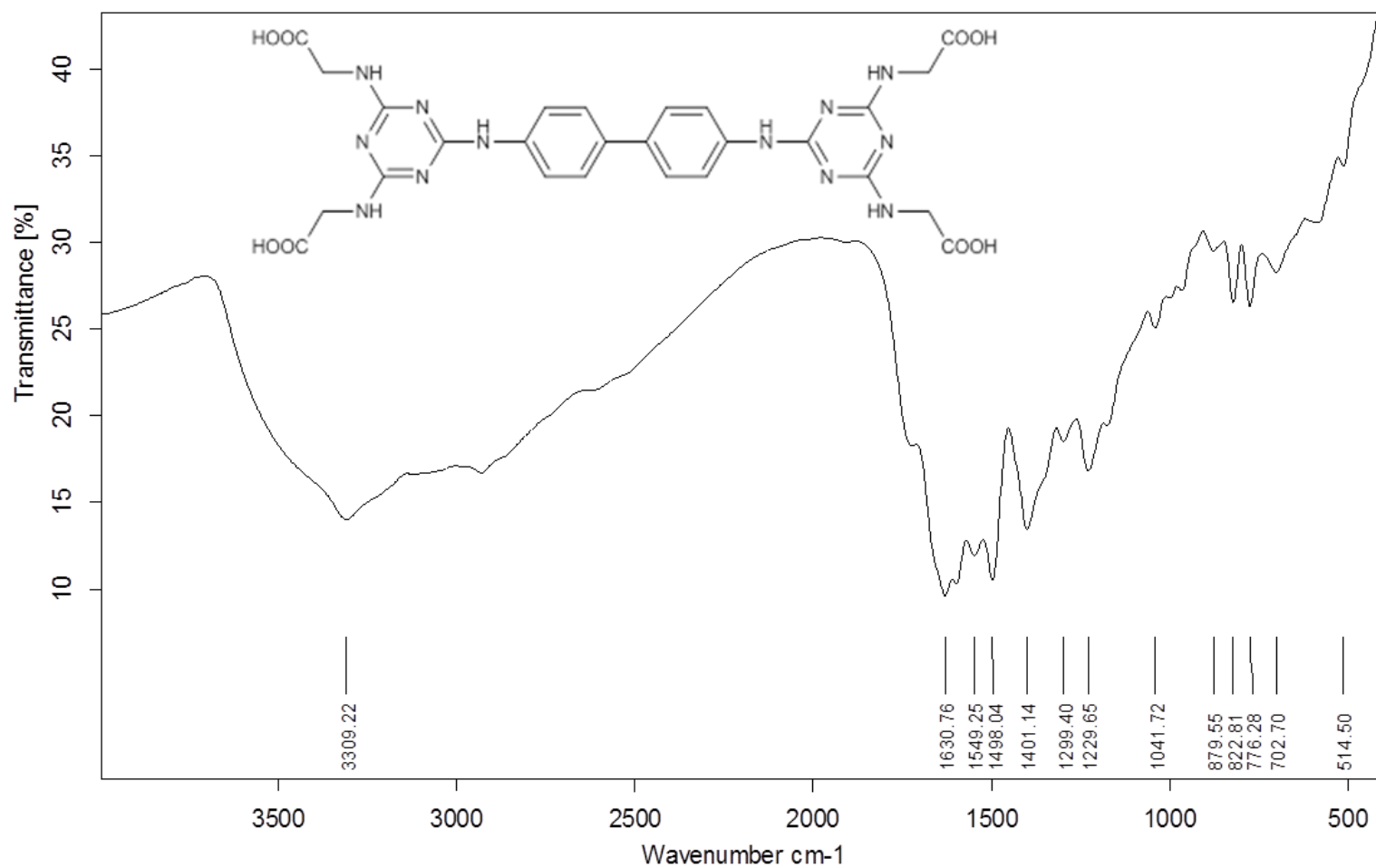


Figure 7: IR (KBr) spectrum of 2,2',2'',2'''-((6,6'-(1,4-phenylenebis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetraacetic acid **9**.

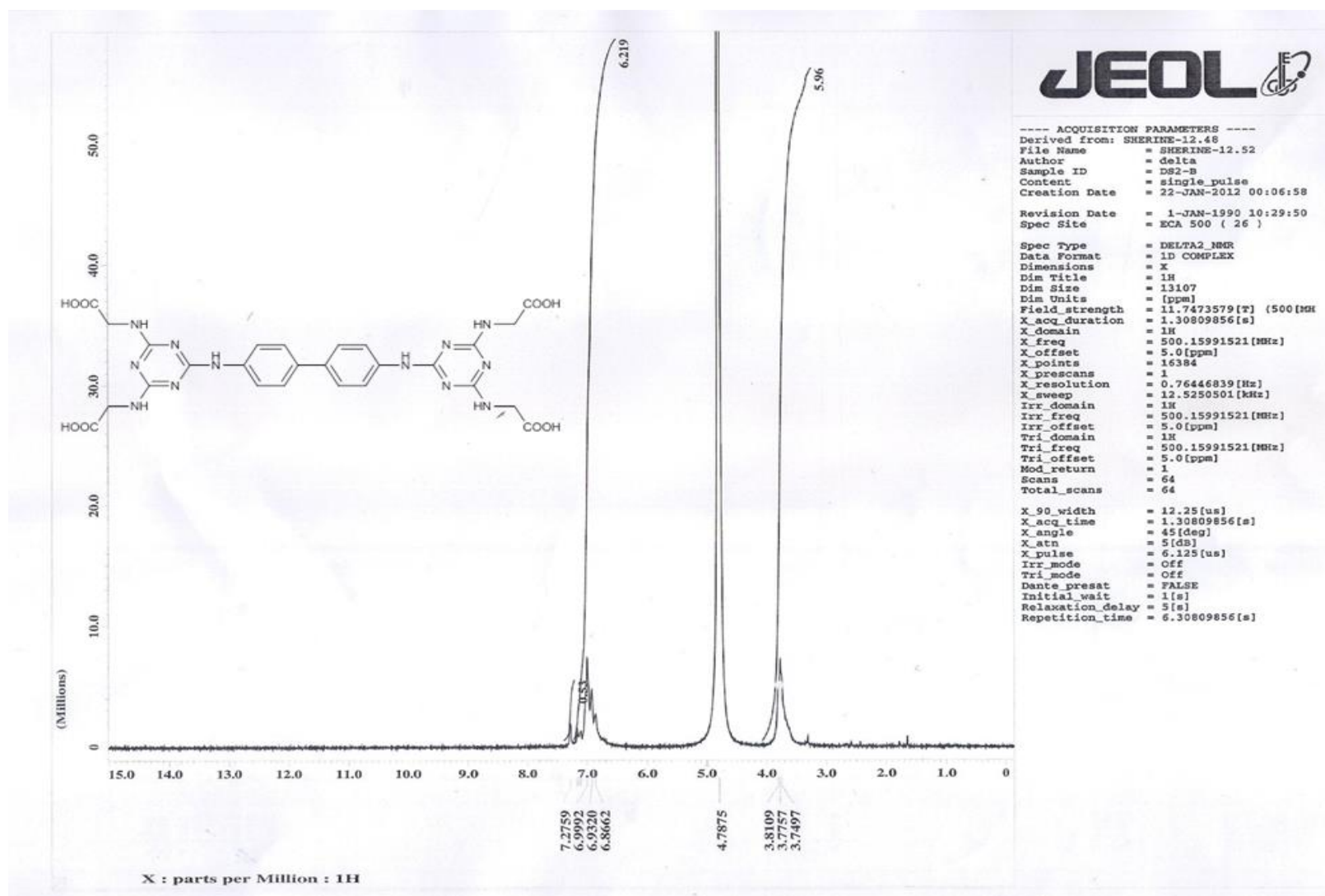


Figure 8: ^1H -NMR ($\text{DMSO-}d_6$ D_2O) spectrum of 2,2',2'',2'''-((6,6'-(1,4-phenylenebis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetraacetic acid **9**.

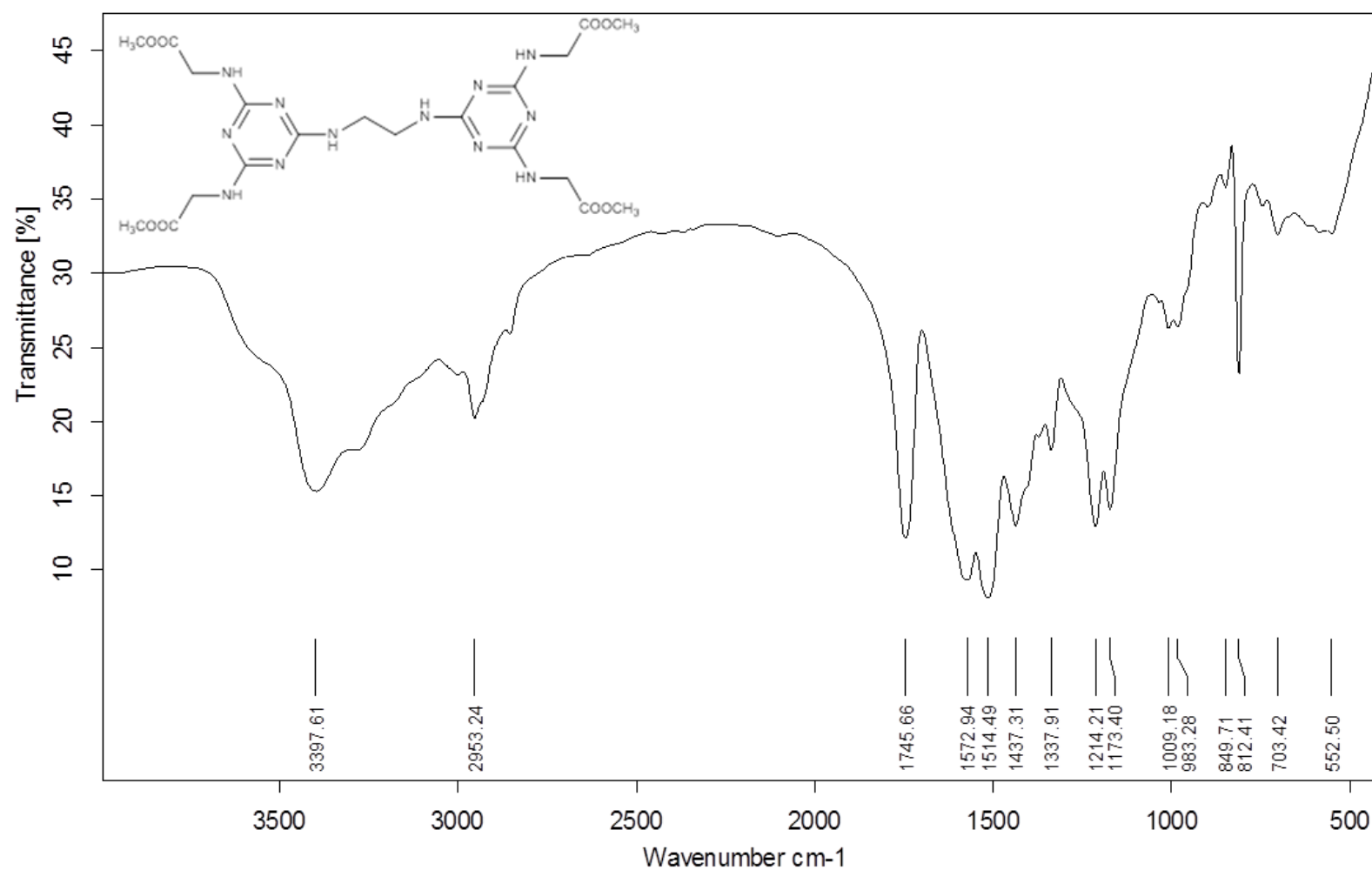


Figure 9: IR (KBr) spectrum of tetramethyl2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl)) bis(1,3,5-triazine-6,4,2-triyl) tetrakis(azanediyl))tetraacetate **10**.

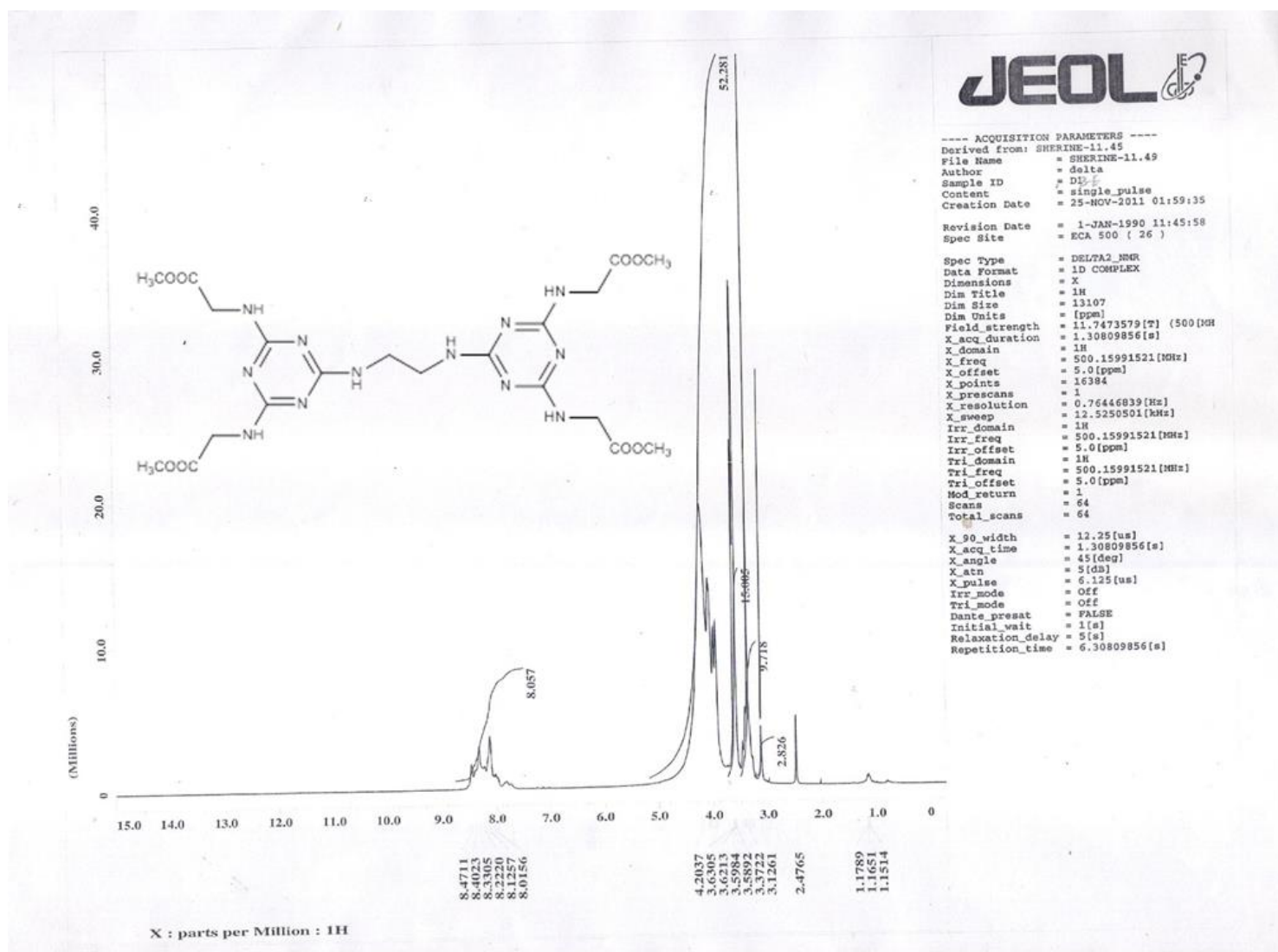


Figure 10: ¹H-NMR (DMSO-*d*₆) spectrum of tetramethyl2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediy)) bis(1,3,5-triazine-6,4,2-triyl) tetrakis(azanediy))tetraacetate **10**.

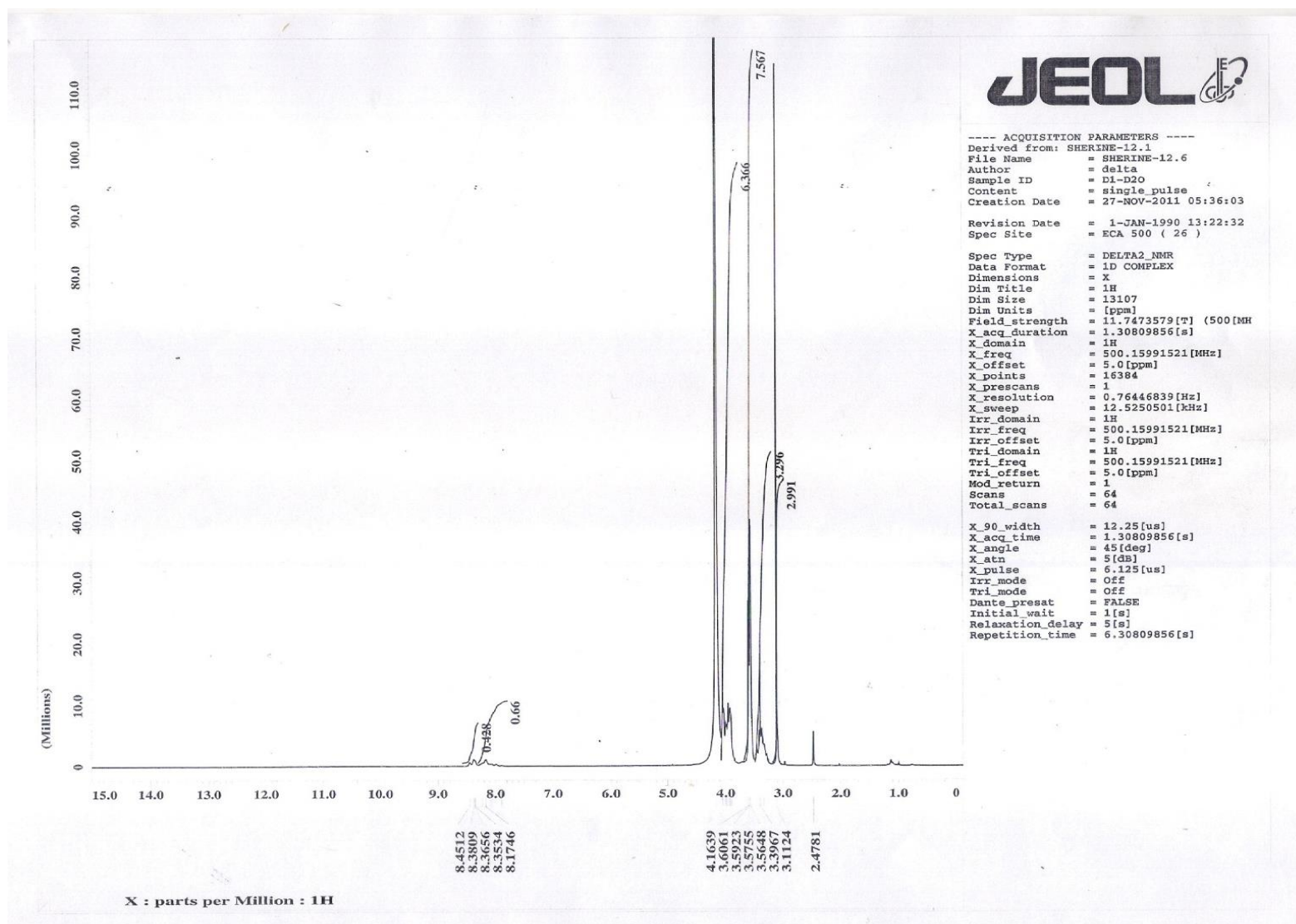


Figure 11: ^1H -NMR ($\text{DMSO-}d_6$ D_2O) spectrum of tetramethyl2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl)) bis(1,3,5-triazine-6,4,2-triyl) tetrakis(azanediyl))tetraacetate **10**.

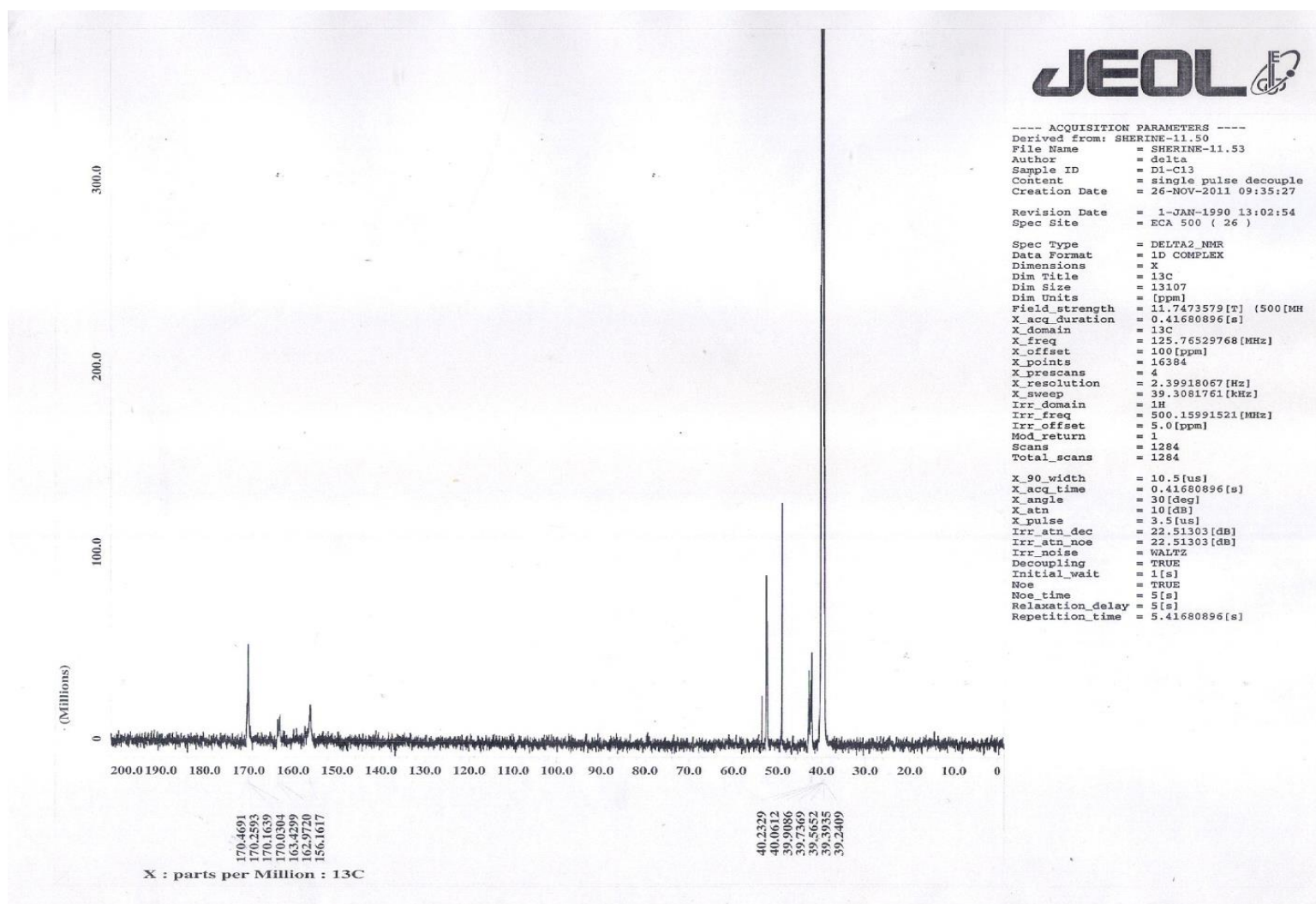


Figure 12: ^{13}C -NMR ($\text{DMSO}-d_6$) spectrum of tetramethyl2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl)) bis(1,3,5-triazine-6,4,2-triyl)tetrakis(azanediyl))tetraacetate **10**.

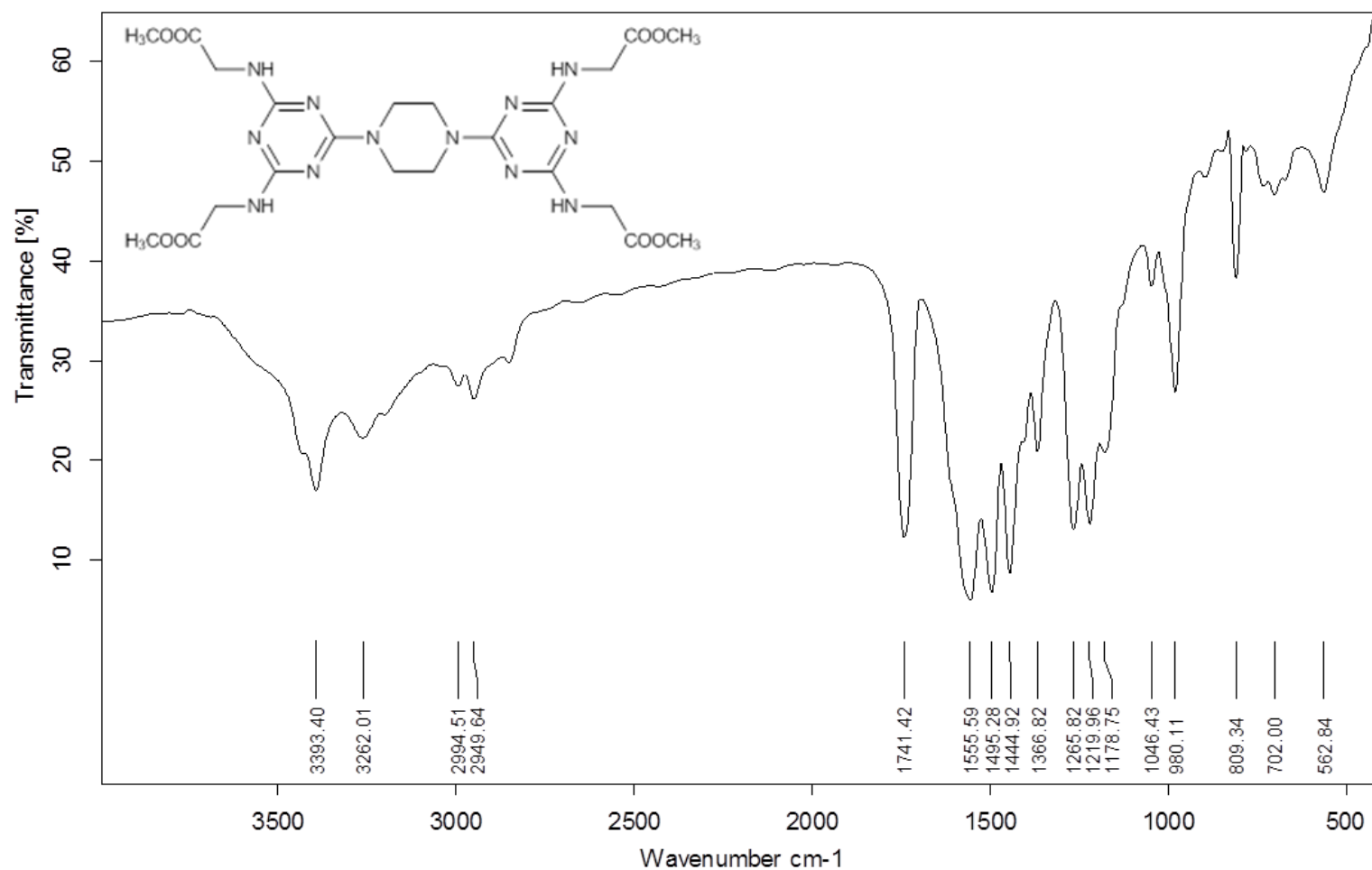


Figure 13: IR (KBr) spectrum of tetramethyl 2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis (azanediyl))tetraacetate **11**.

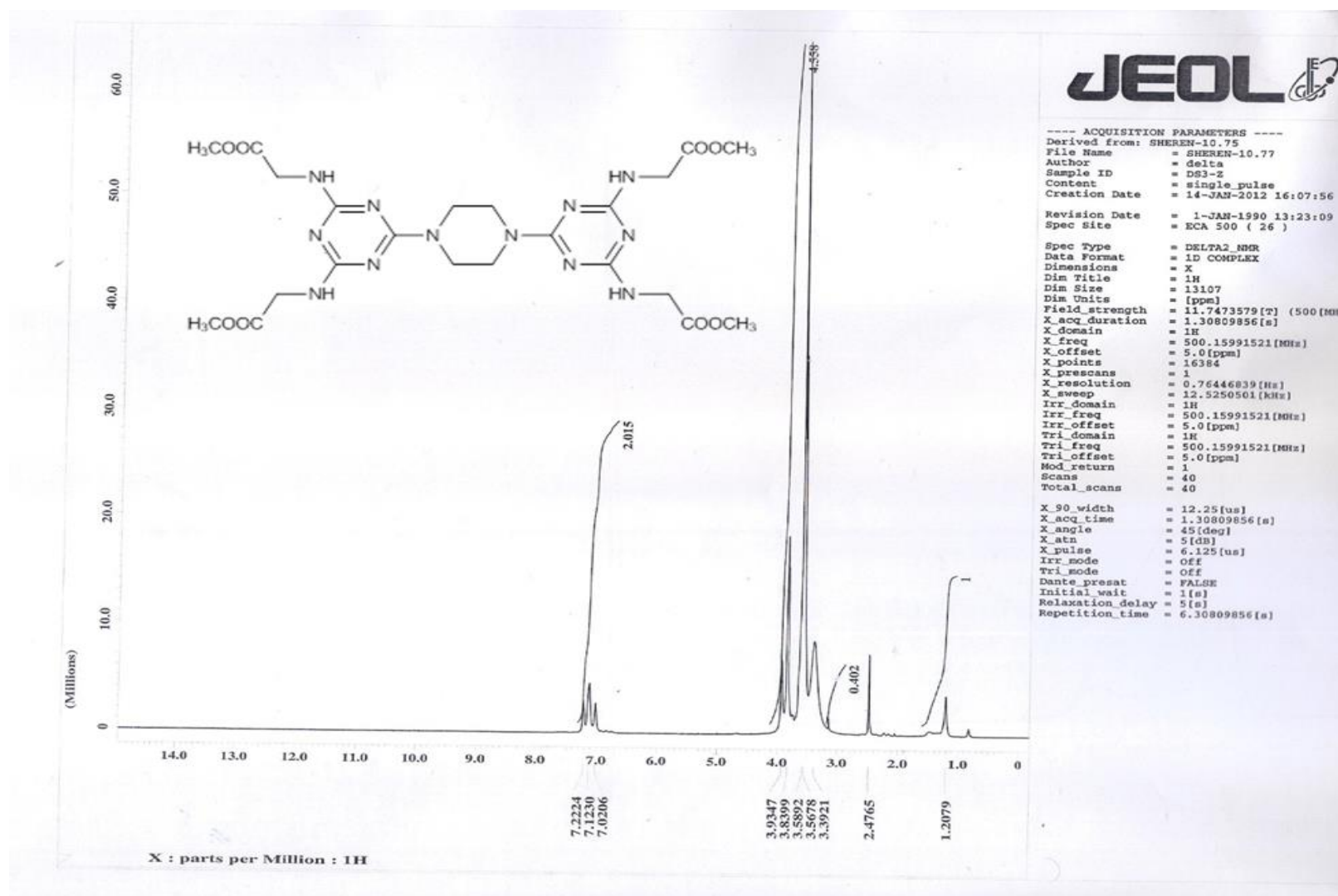


Figure 14: ¹H-NMR (DMSO-*d*₆) spectrum of tetramethyl 2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis (azanediy))tetraacetate **11**.

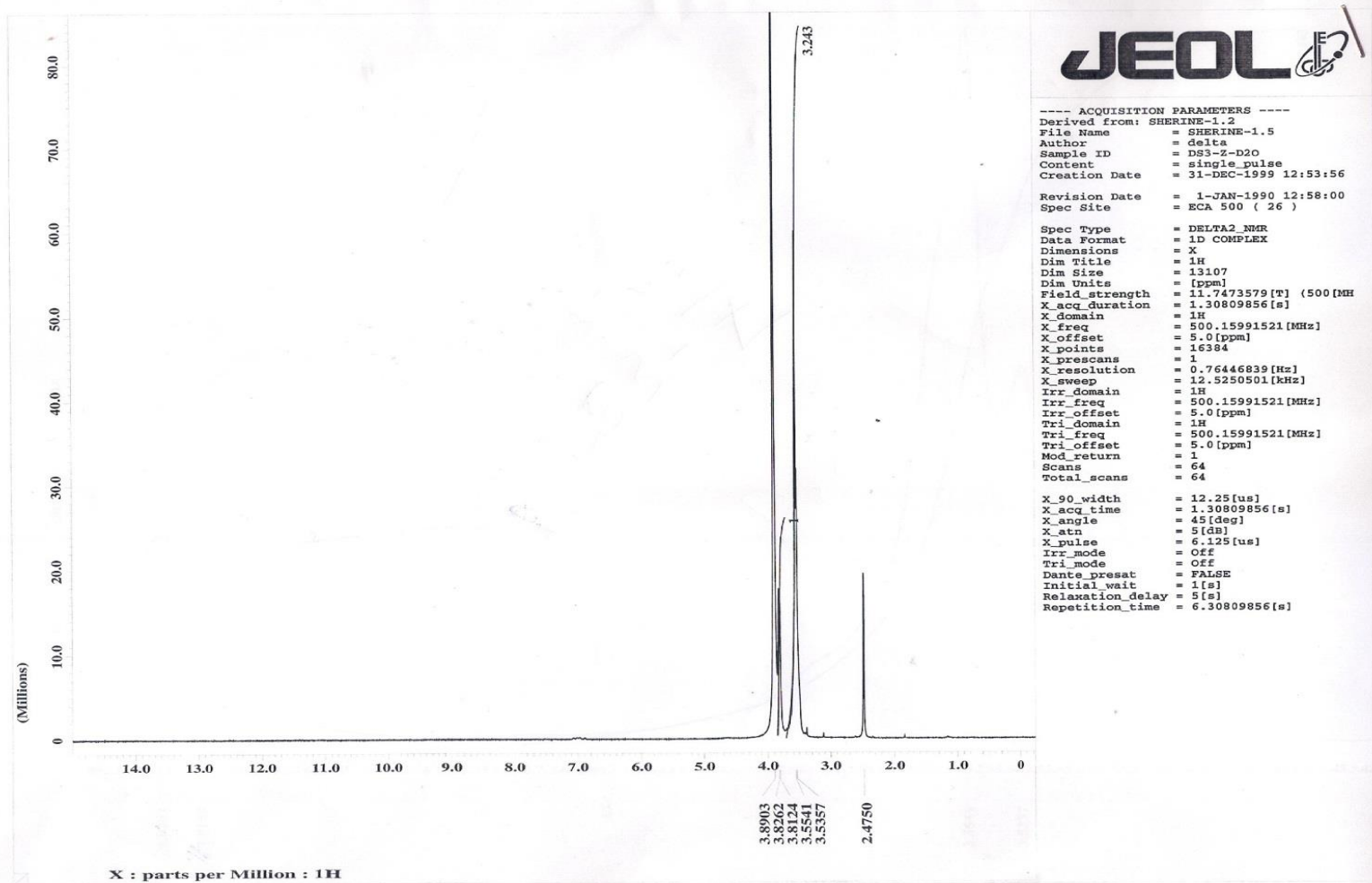


Figure 15: ^1H -NMR ($\text{DMSO}-d_6\text{D}_2\text{O}$) spectrum of tetramethyl 2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetraacetate **11**.

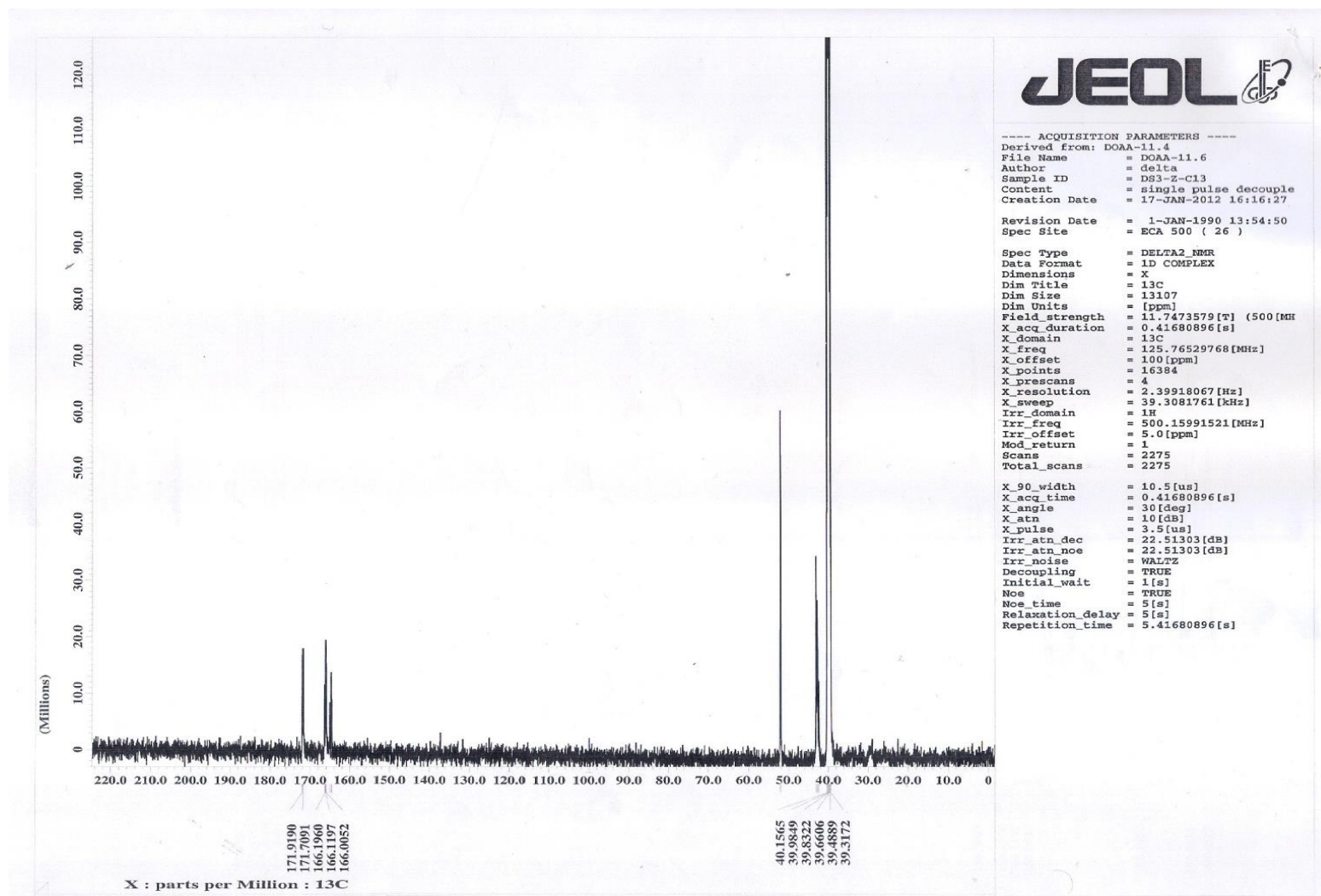


Figure 16: ^{13}C -NMR ($\text{DMSO}-d_6$) spectrum of tetramethyl 2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis (azanediy))tetraacetate **11**.

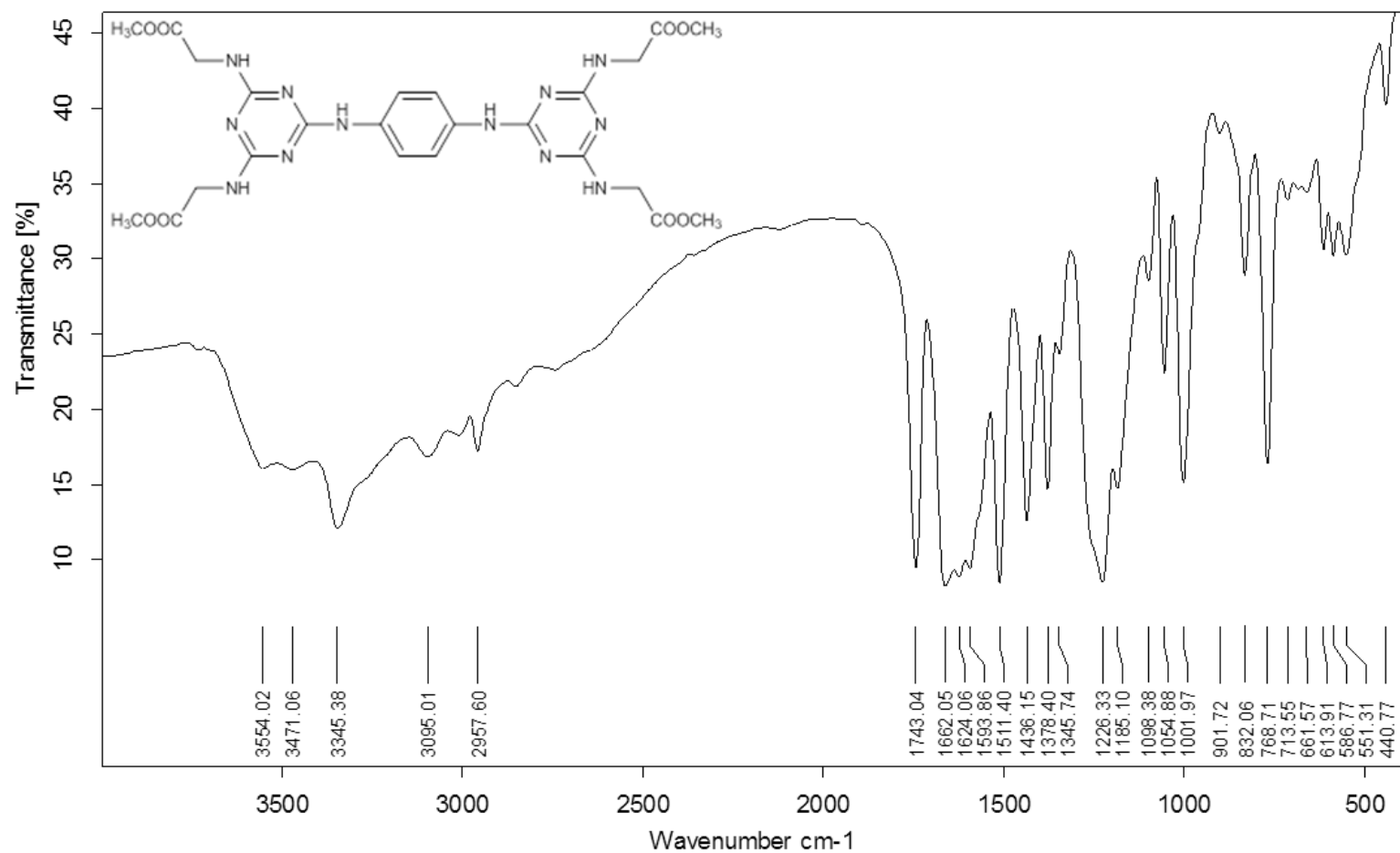


Figure 17: IR (KBr) spectrum of tetramethyl 2,2',2'',2'''-((6,6'-(1,4-phenylenebis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetraacetate **12**.

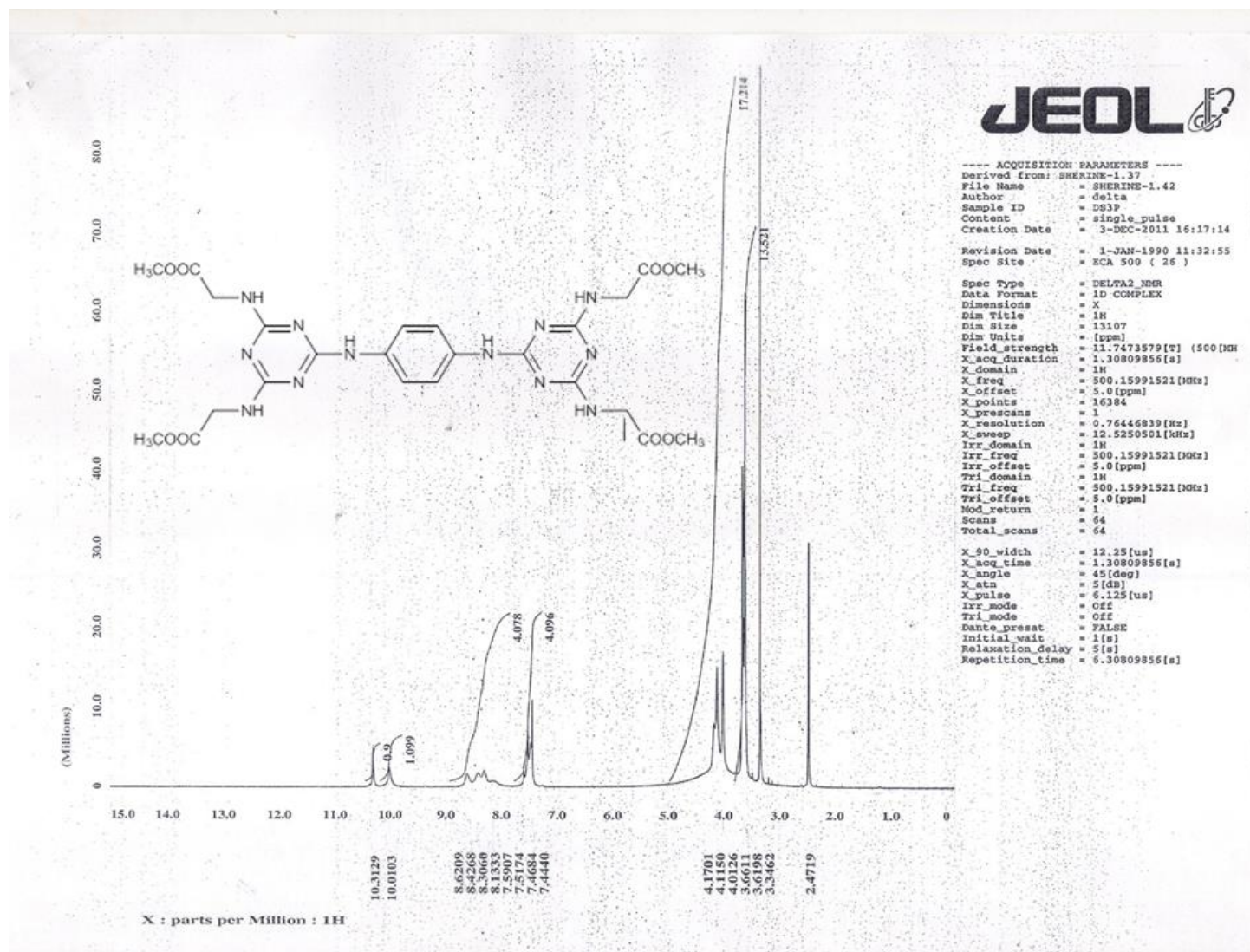


Figure 18: ¹H-NMR (DMSO-*d*₆) spectrum of tetramethyl 2,2',2'',2'''-((6,6'-(1,4-phenylenebis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetraacetate **12**.

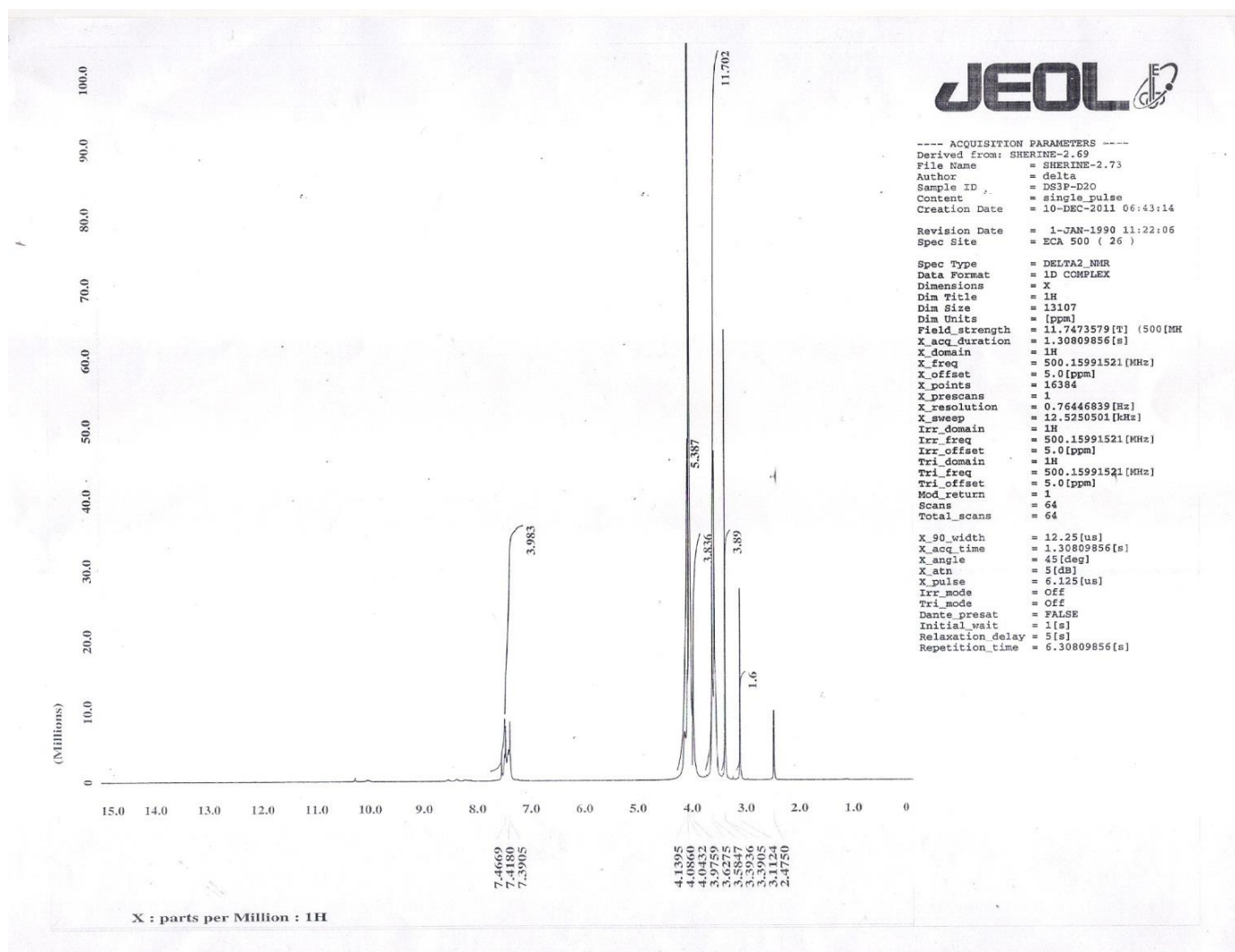


Figure 19: ^1H -NMR (DMSO- d_6 D $_2$ O) spectrum of tetramethyl 2,2',2'',2'''-((6,6'-(1,4-phenylenebis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetraacetate **12**.

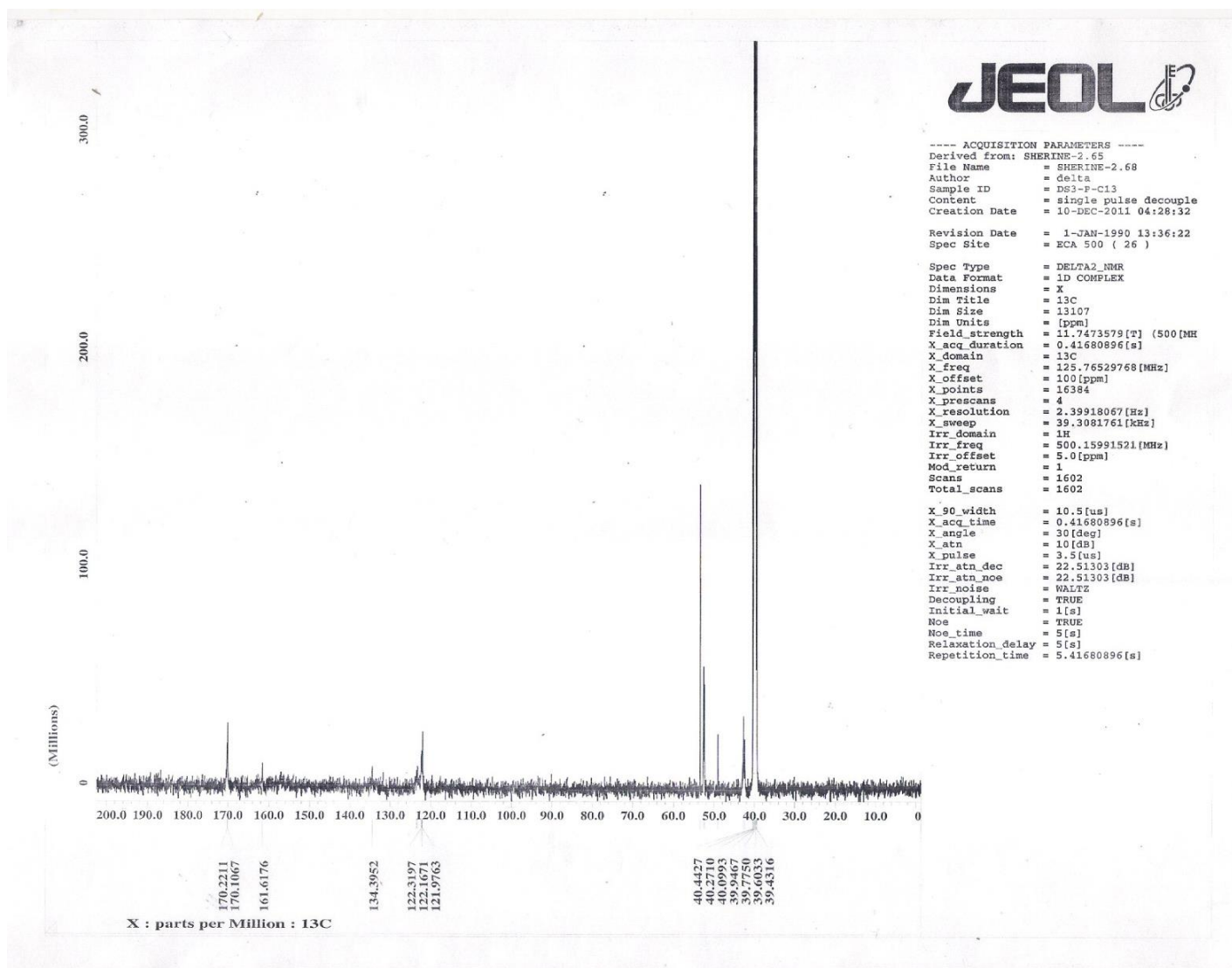


Figure 20: ^{13}C -NMR ($\text{DMSO}-d_6$) spectrum of tetramethyl 2,2',2'',2'''-((6,6'-(1,4-phenylenebis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetraacetate **12**.

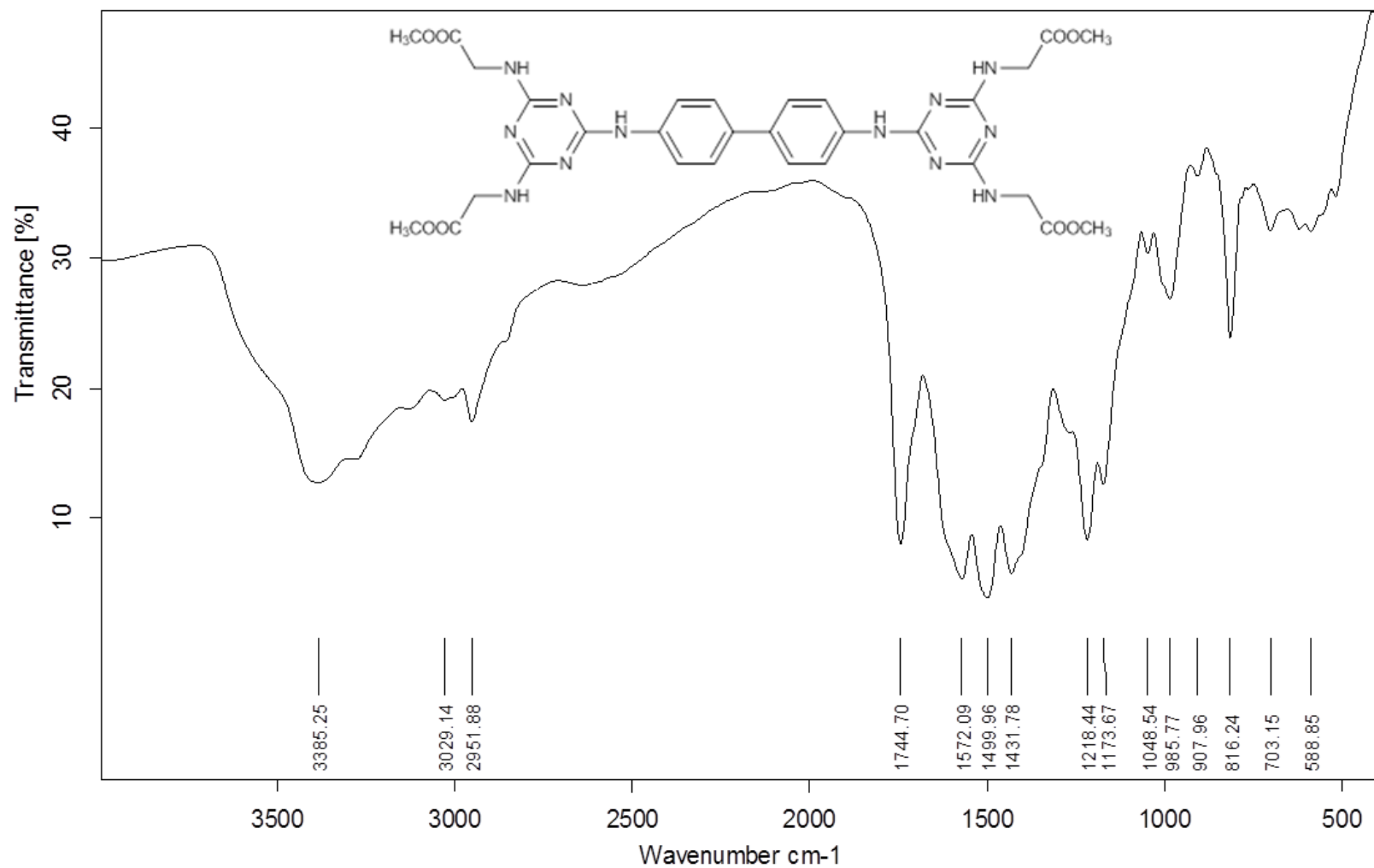


Figure 21: IR (KBr) spectrum of tetramethyl 2,2',2'',2'''-((6,6'-([1,1'-biphenyl]-4,4'-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetraacetate **13**.

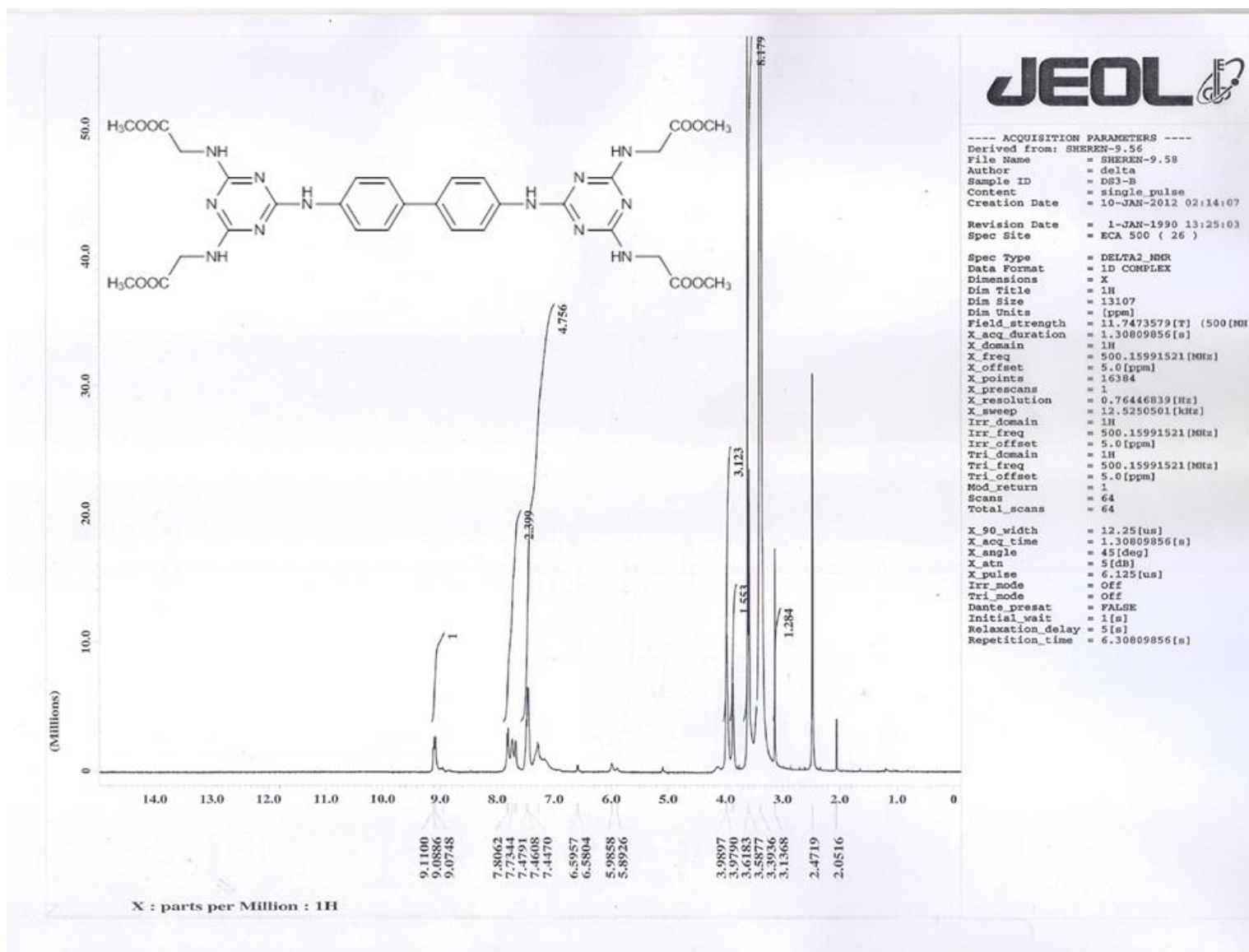


Figure 22: ¹H-NMR (DMSO-*d*₆) spectrum of tetramethyl 2,2',2'',2'''-((6,6'-([1,1'-biphenyl]-4,4'-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetraacetate **13**.

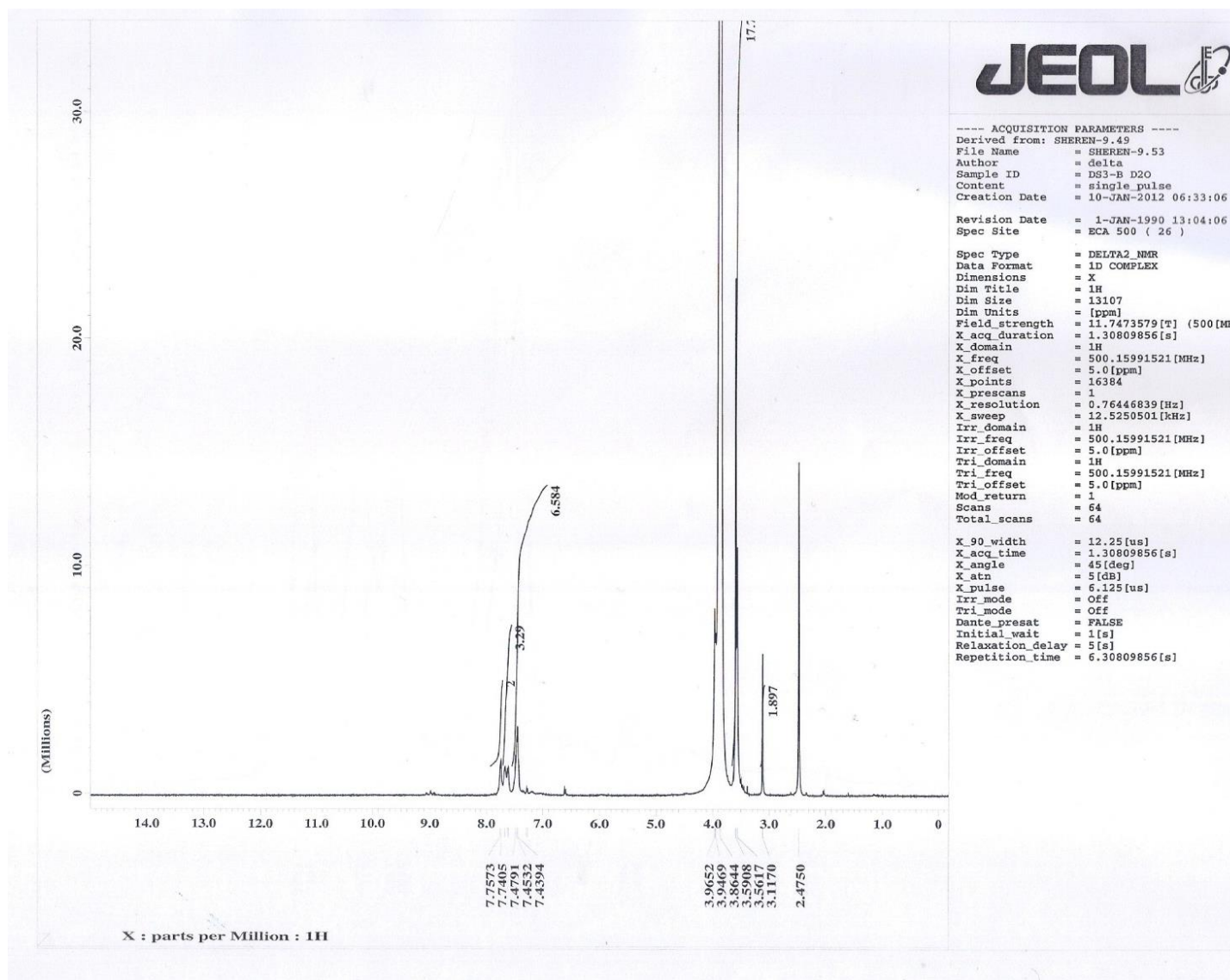


Figure 23: ^1H -NMR ($\text{DMSO}-d_6$) spectrum of tetramethyl 2,2',2'',2'''-((6,6'-([1,1'-biphenyl]-4,4'-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetraacetate **13**.

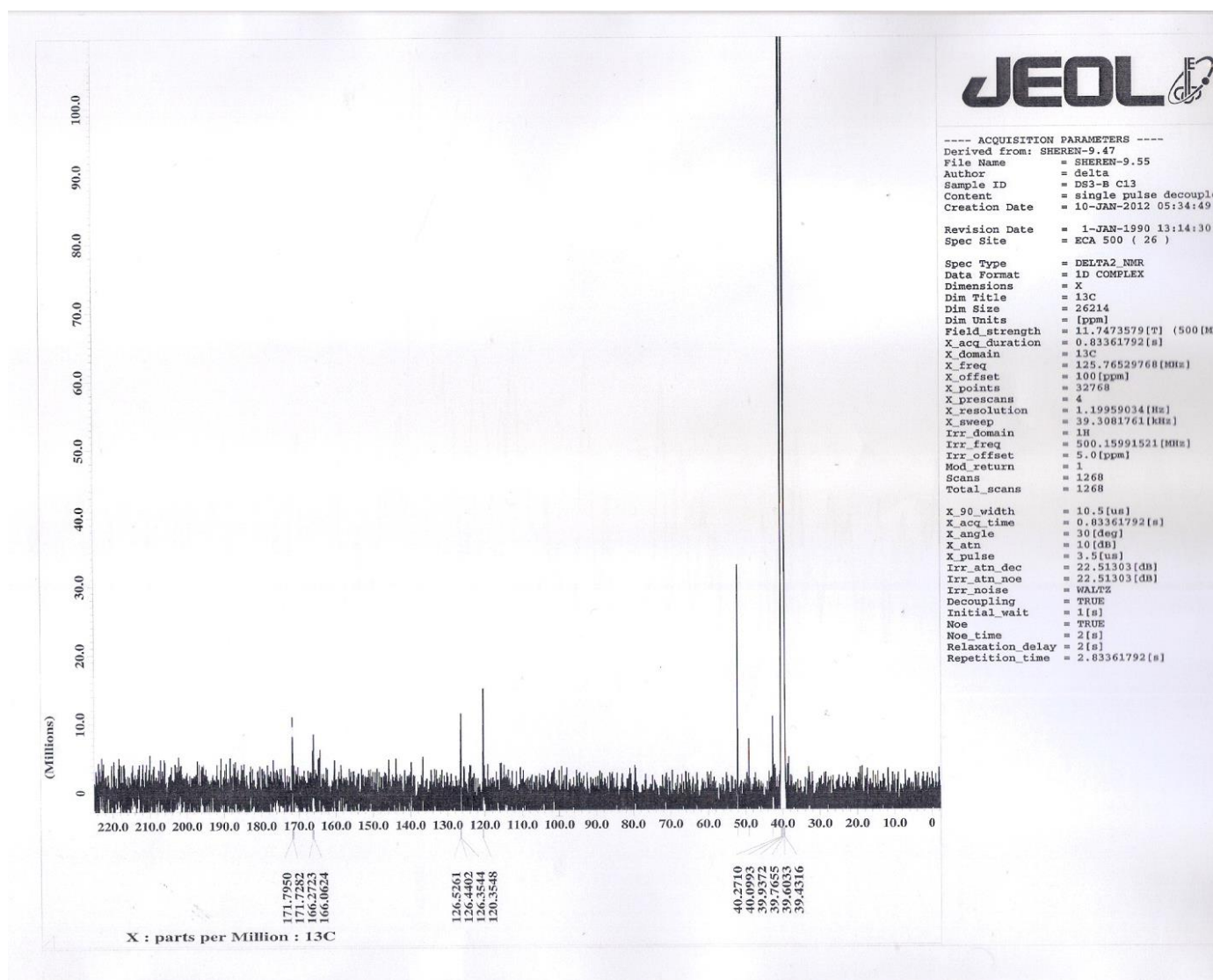


Figure 24: ^{13}C -NMR ($\text{DMSO}-d_6$) spectrum of tetramethyl 2,2',2'',2'''-((6,6'-([1,1'-biphenyl]-4,4'-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetraacetate **13**.

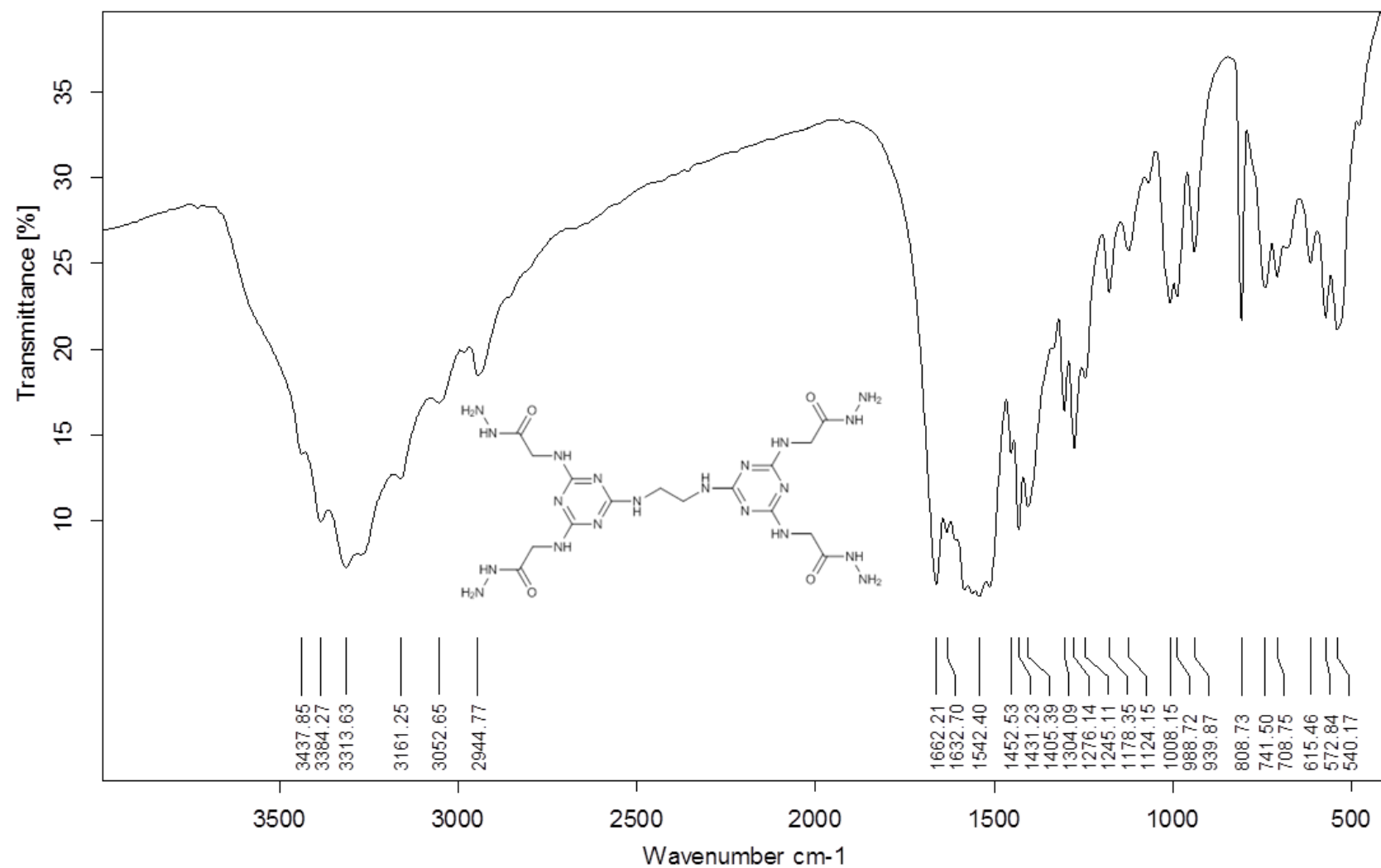


Figure 25: IR (KBr) spectrum of 2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetra(acetohydrazide) **14**.

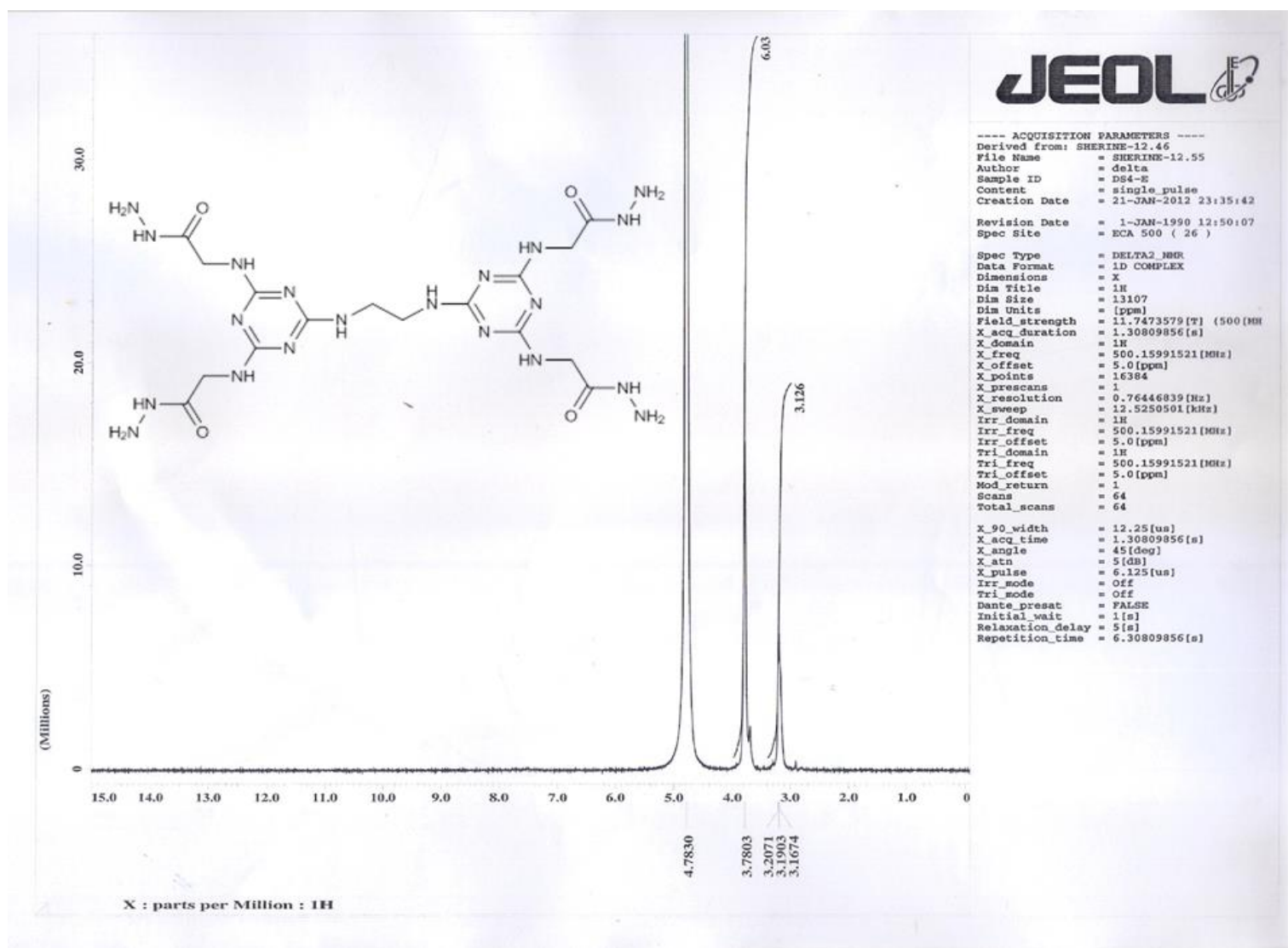


Figure 26: ^1H -NMR ($\text{DMSO-}d_6$ D_2O) spectrum of 2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl)))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetra(acetohydrazide) **14**.

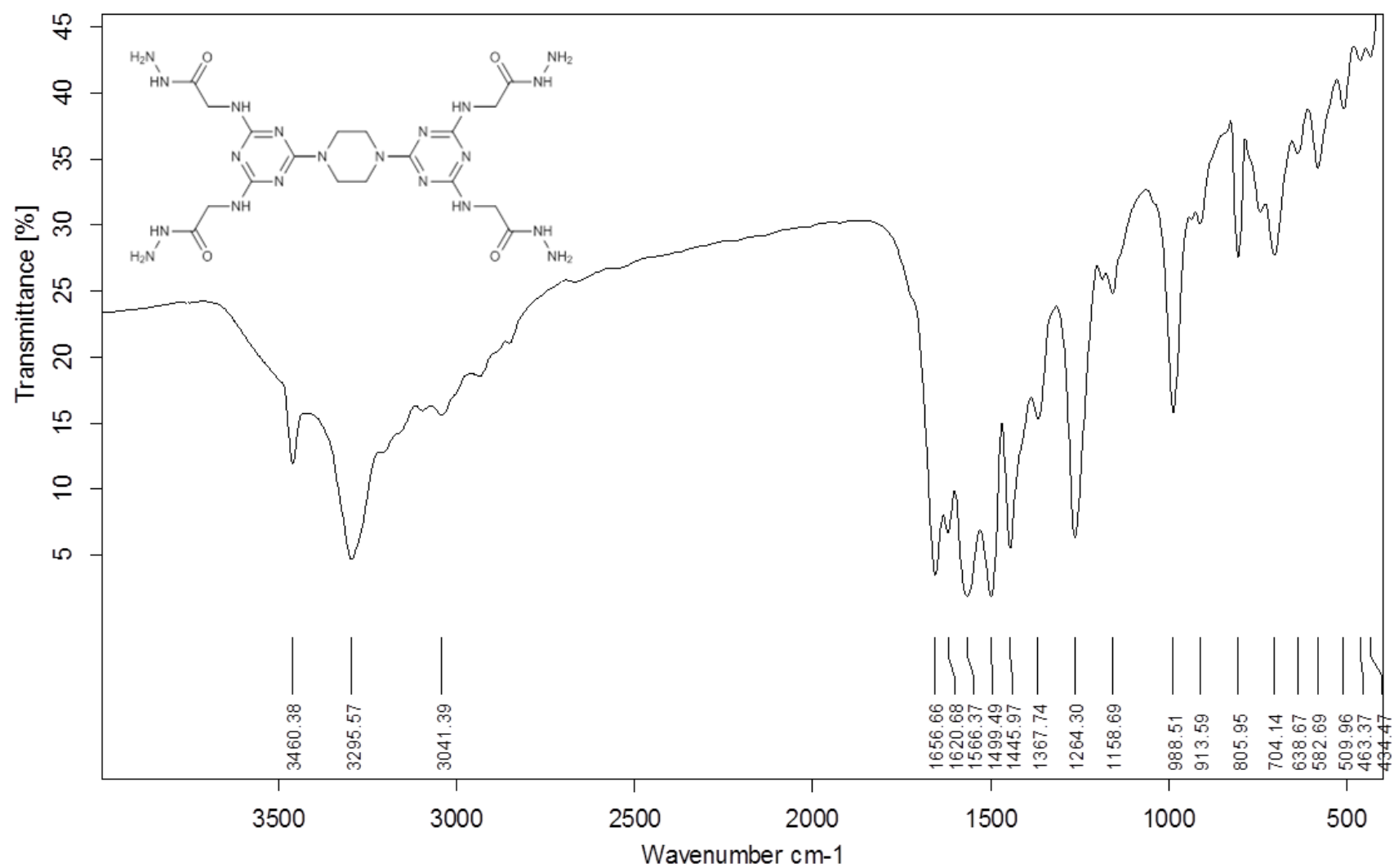


Figure 27: IR (KBr) spectrum of 2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetra(acetohydrazide) **15**.

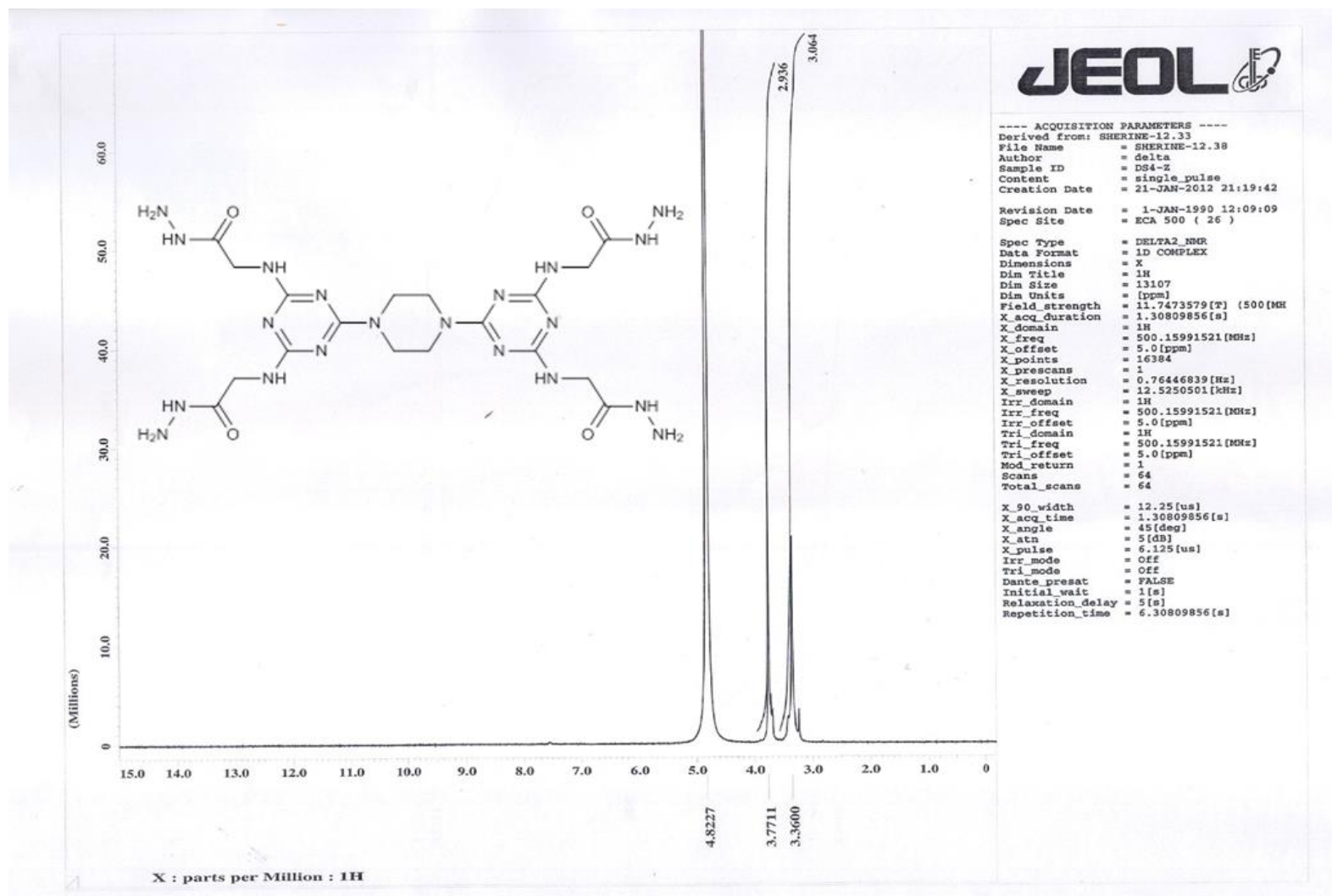


Figure 28: ¹H-NMR (DMSO-*d*₆ D₂O) spectrum of 2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetra(acetohydrazide) **15**.

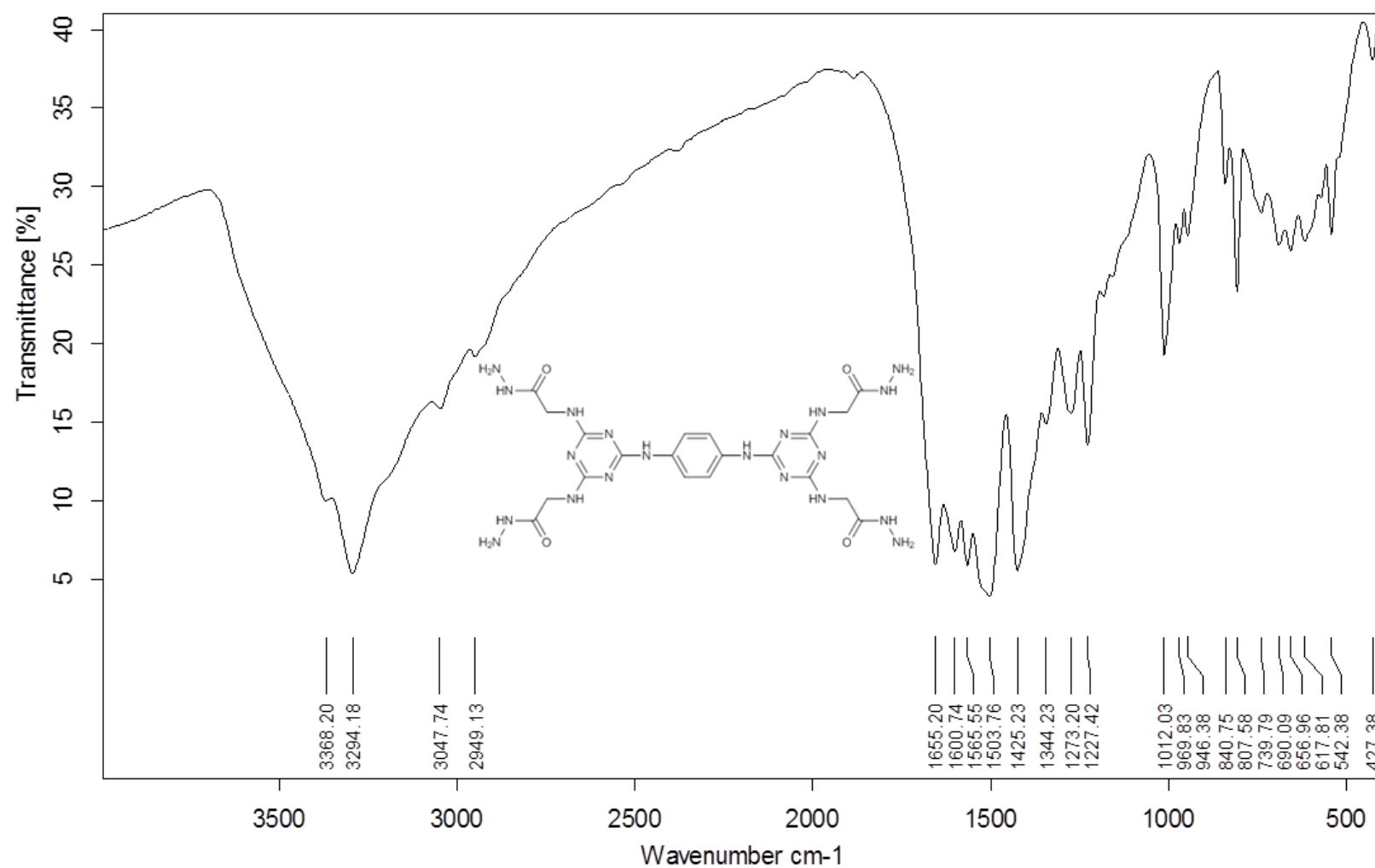


Figure 29: IR (KBr) spectrum of 2,2',2'',2'''-((6,6'-(1,4-phenylenebis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetra(acetohydrazide)**16**.

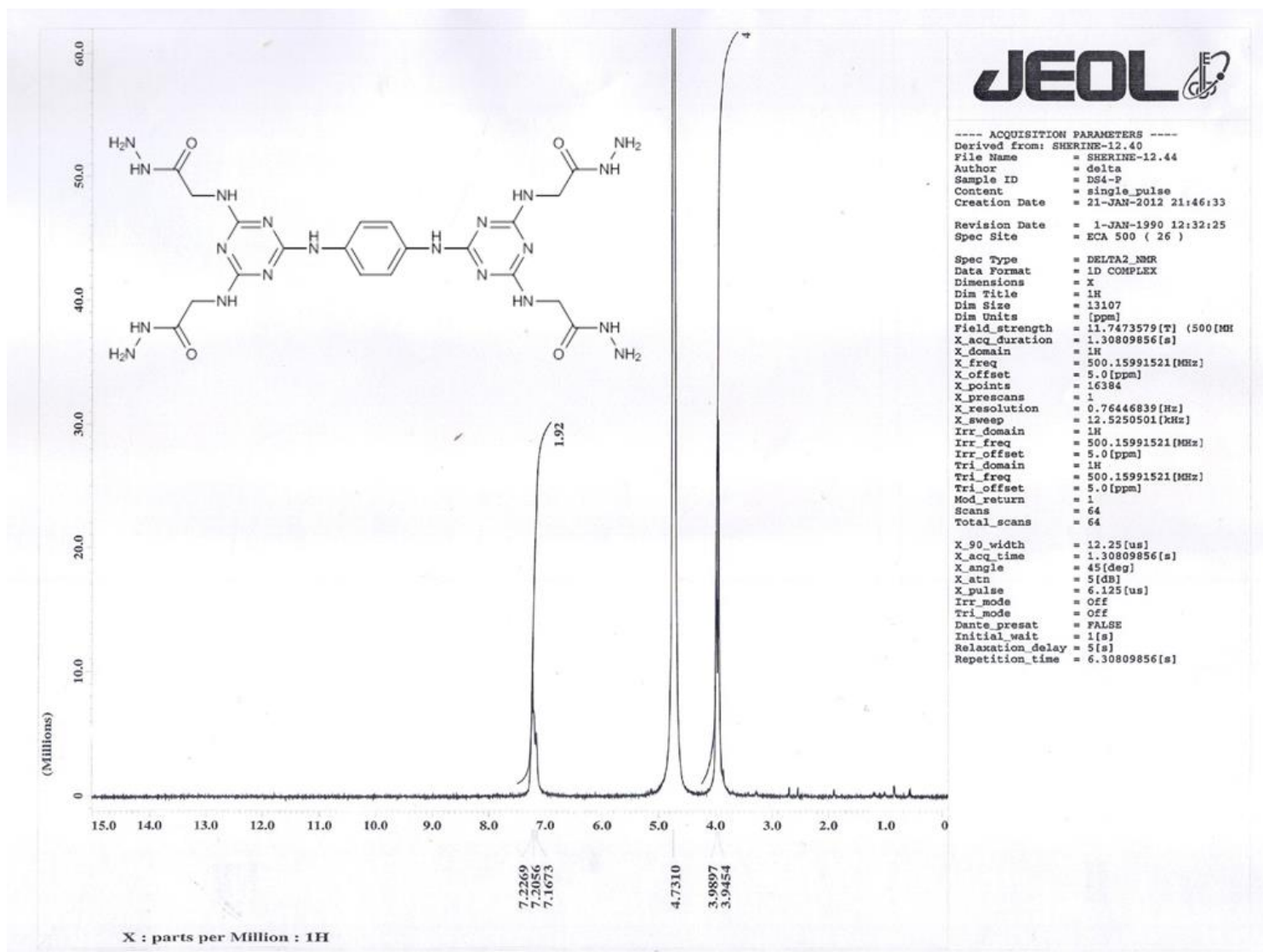


Figure 30: ^1H -NMR (DMSO- d_6 D $_2$ O) spectrum of 2,2',2'',2'''-((6,6'-(1,4-phenylenebis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetra(acetohydrazide) **16**.

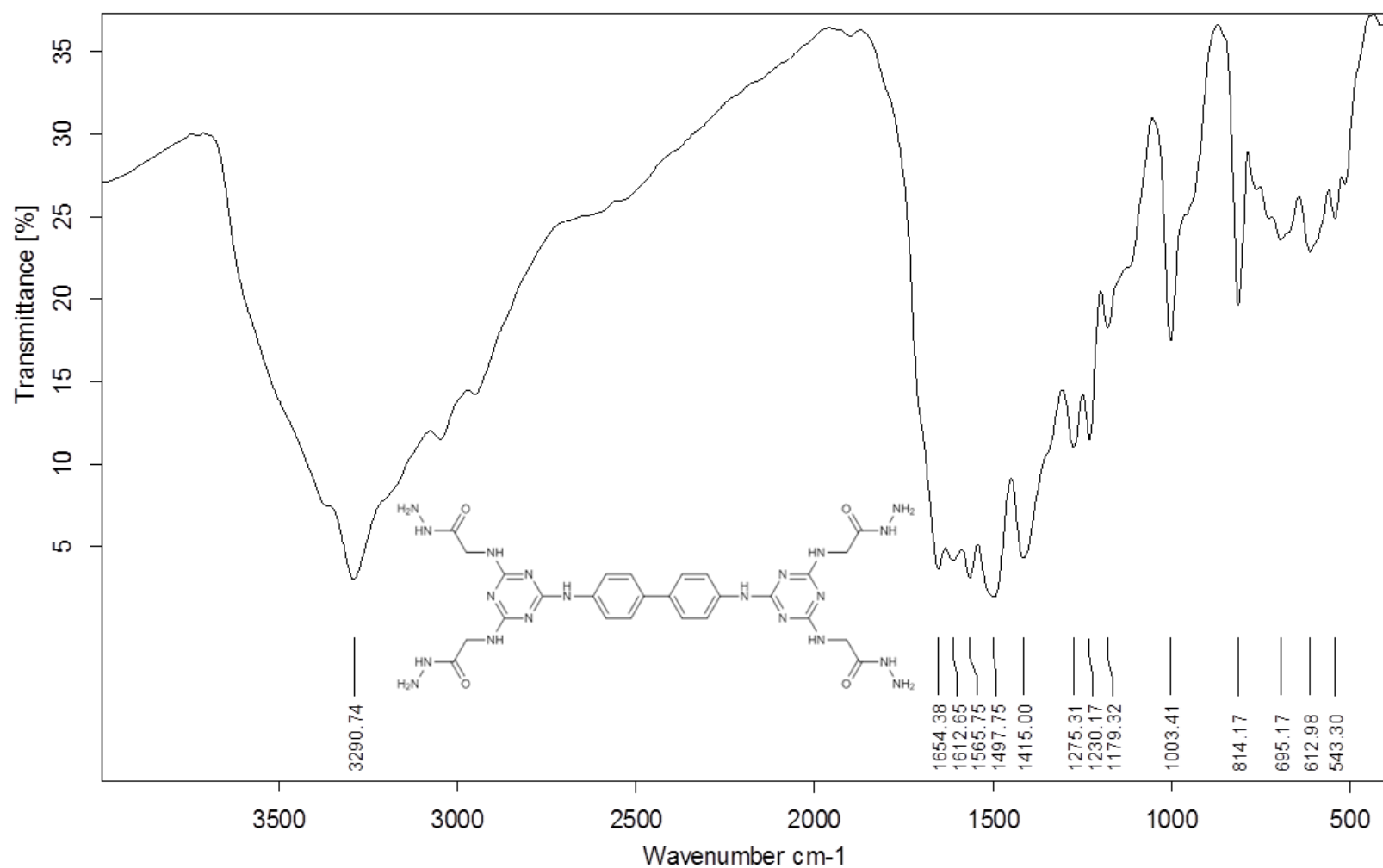


Figure 31: IR (KBr) spectrum of 2,2',2'',2'''-((6,6'-([1,1'-biphenyl]-4,4'-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl)) tetrakis(azanediyl))tetra(acetohydrazide) **17**.

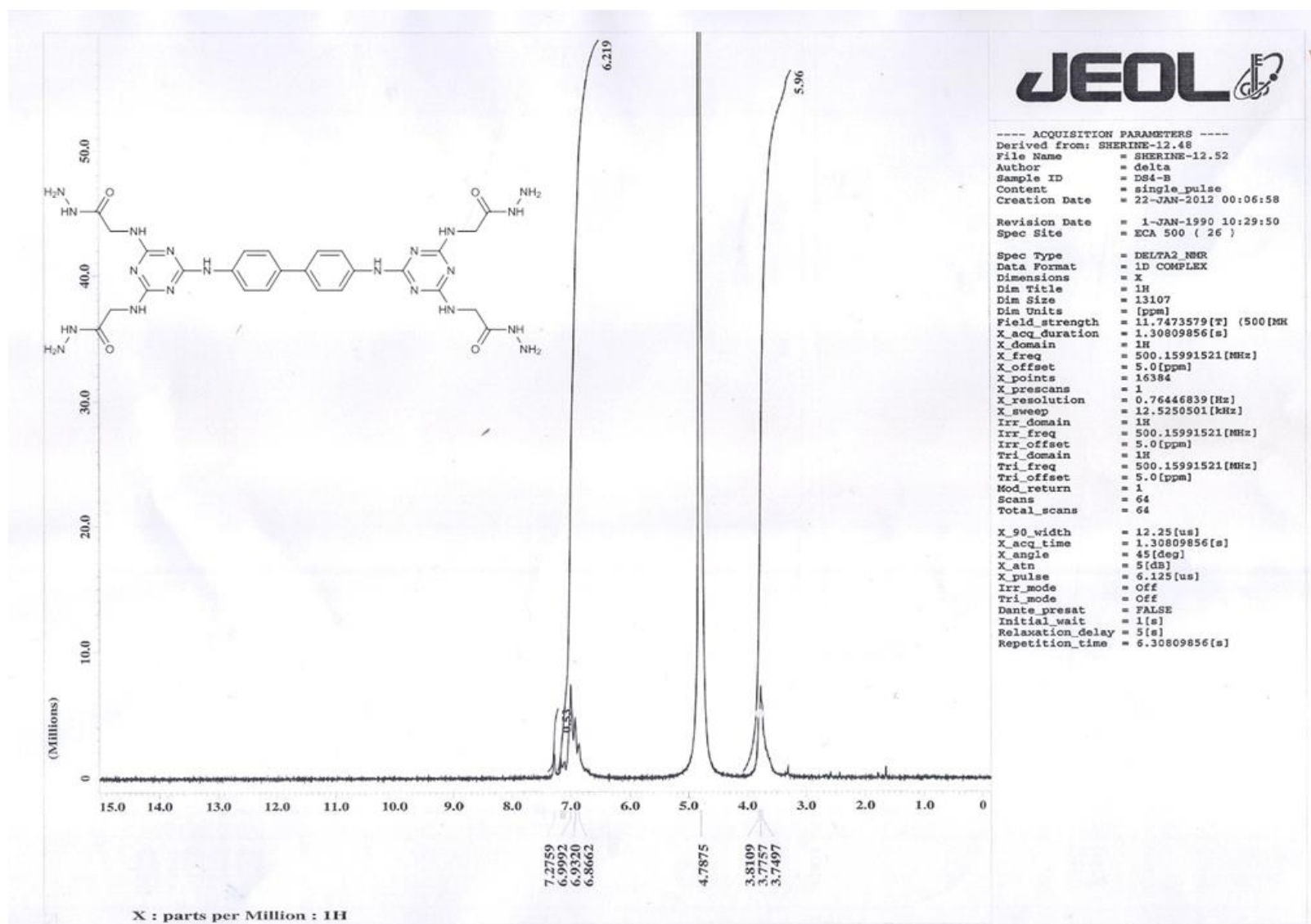


Figure 32: ^1H -NMR (DMSO- d_6 D $_2$ O) spectrum of 2,2',2'',2'''-((6,6'-([1,1'-biphenyl]-4,4'-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetra(acetohydrazide) **17**.

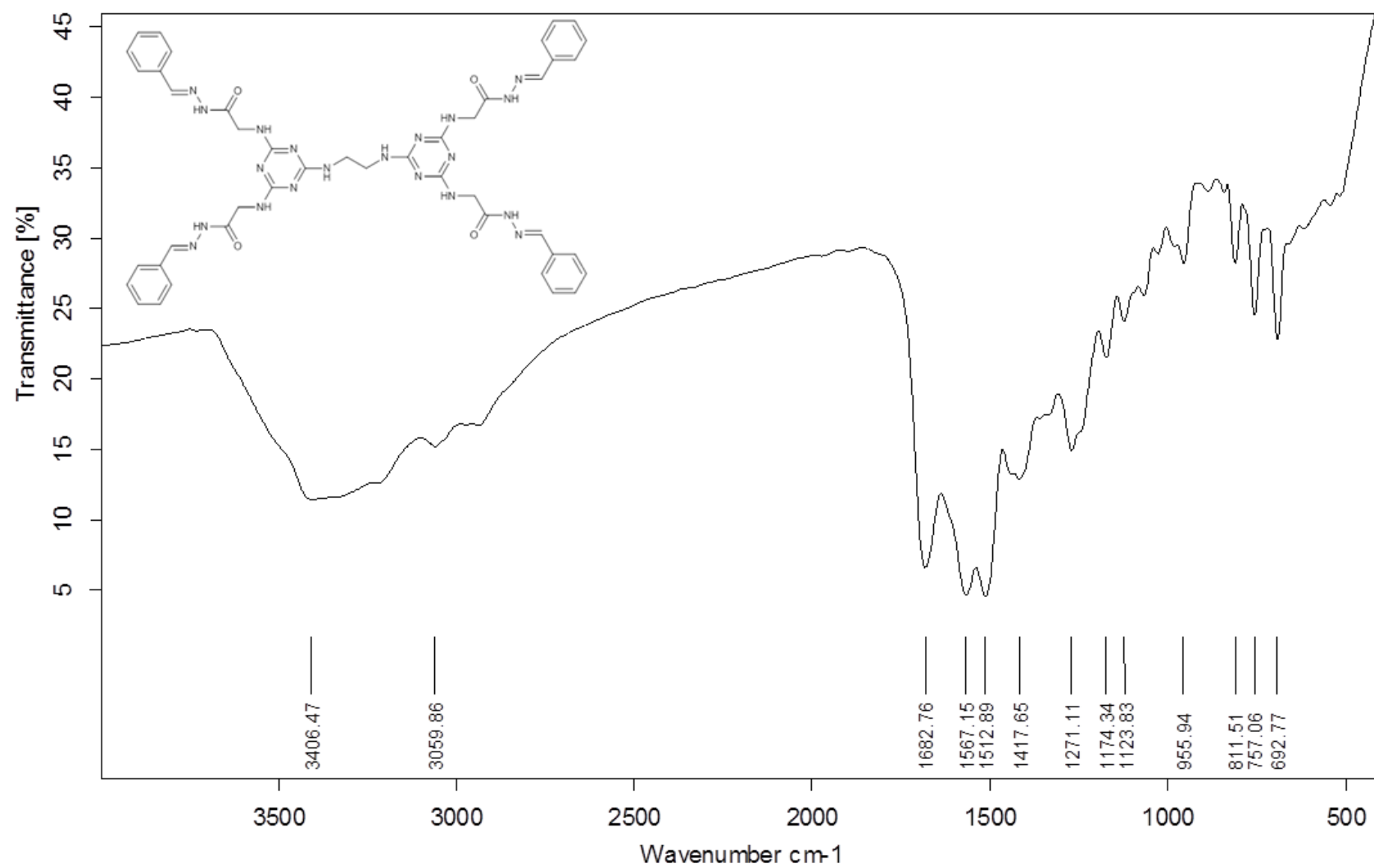


Figure 33: IR (KBr) spectrum of (*N'E,N'''E,N'''''E,N'''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-benzylideneacetohydrazide) **19a**.

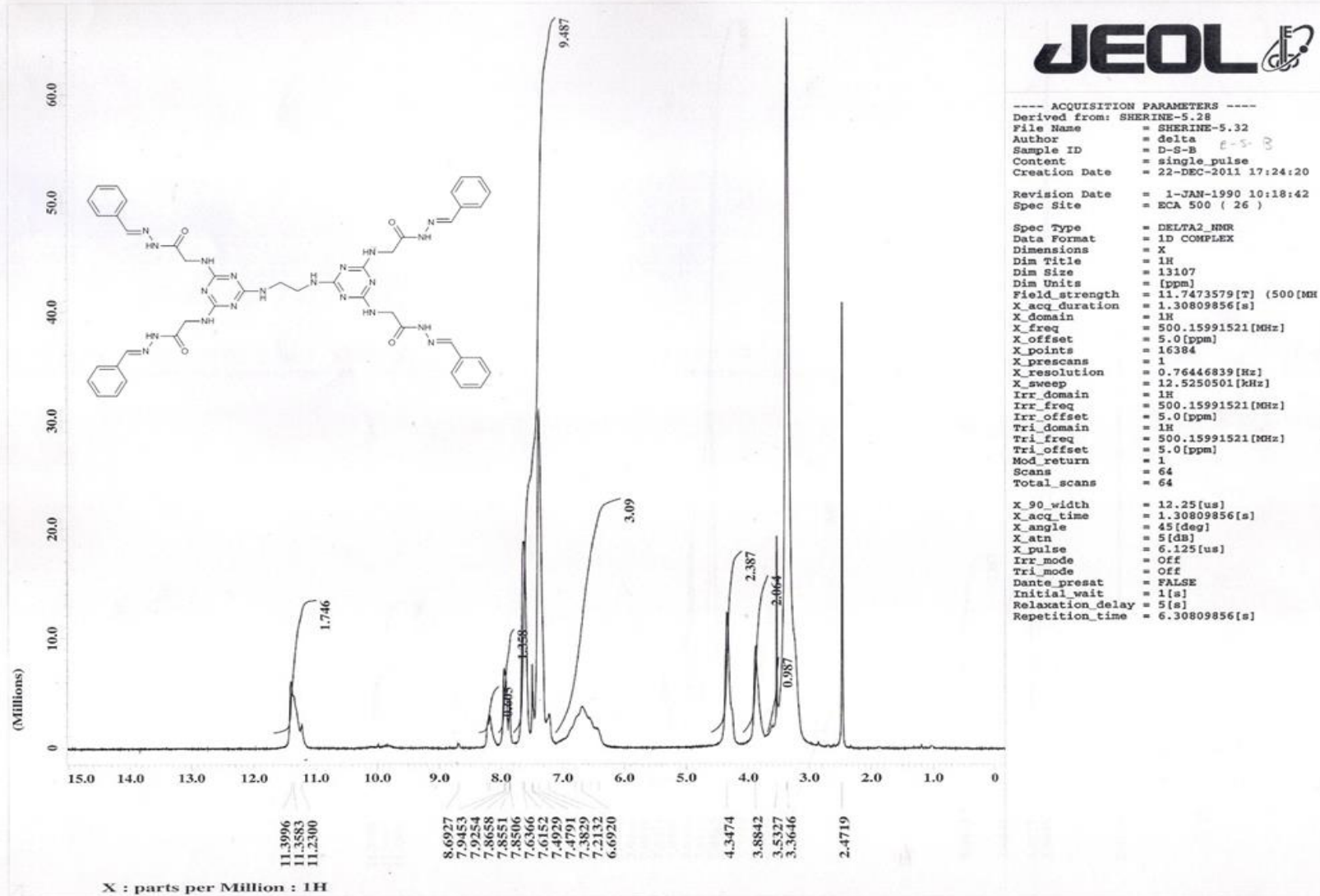


Figure 34: ¹H-NMR (DMSO-*d*₆) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-benzylideneacetohydrazide) **19a**.

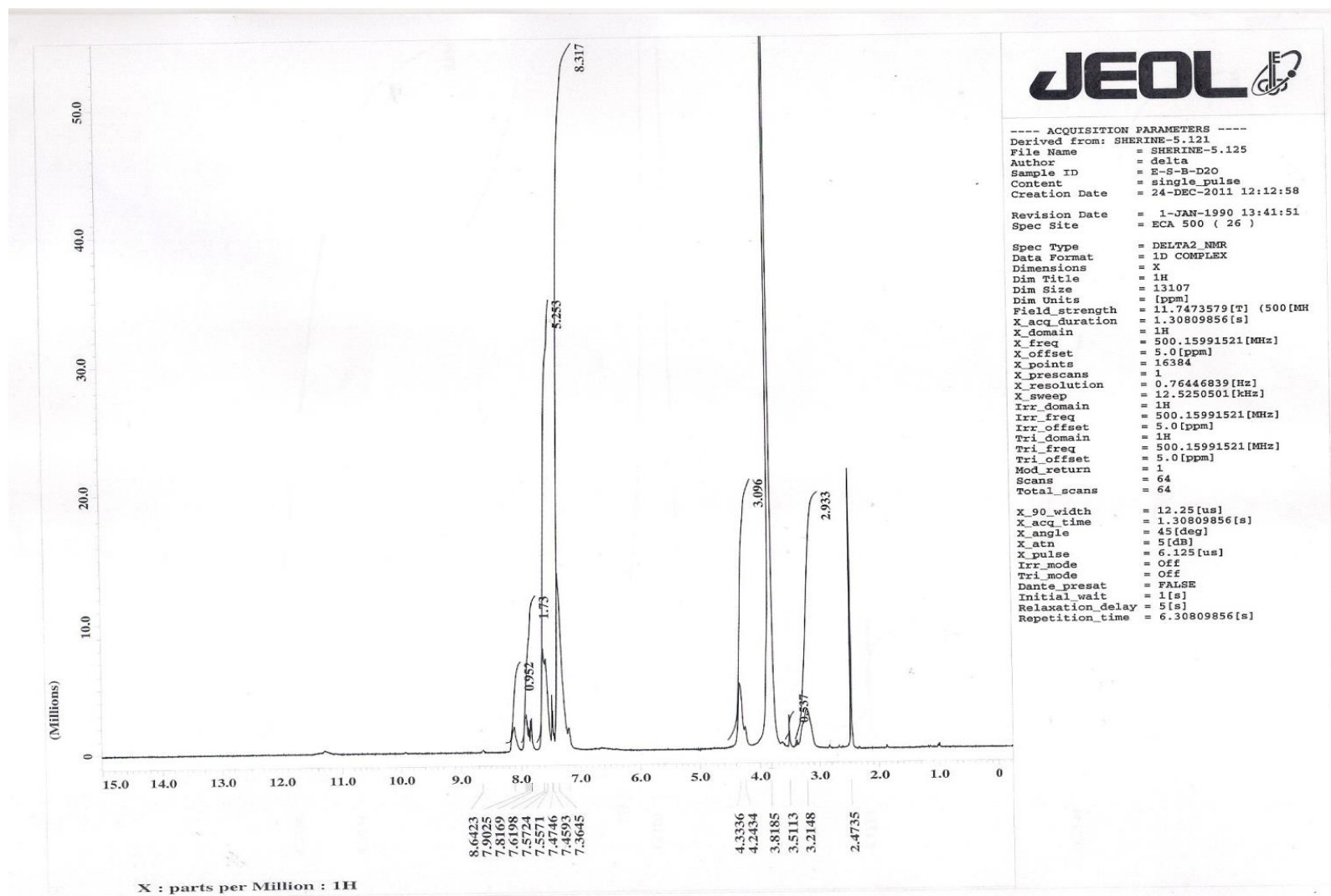


Figure 35: ^1H -NMR ($\text{DMSO}-d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-benzylideneacetohydrazide) **19a**.

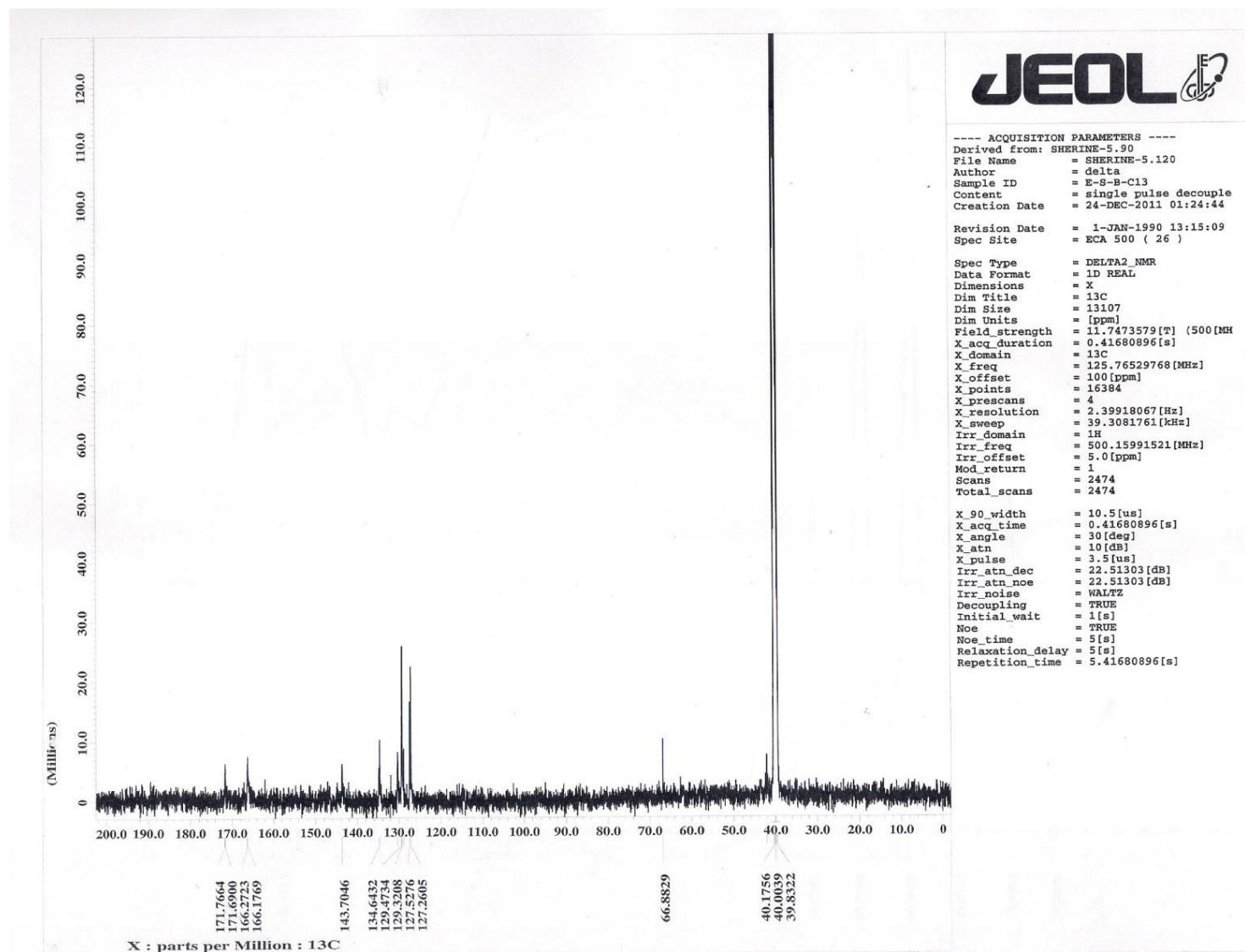


Figure 36: ^{13}C -NMR ($\text{DMSO}-d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-benzylideneacetohydrazide) **19a**.

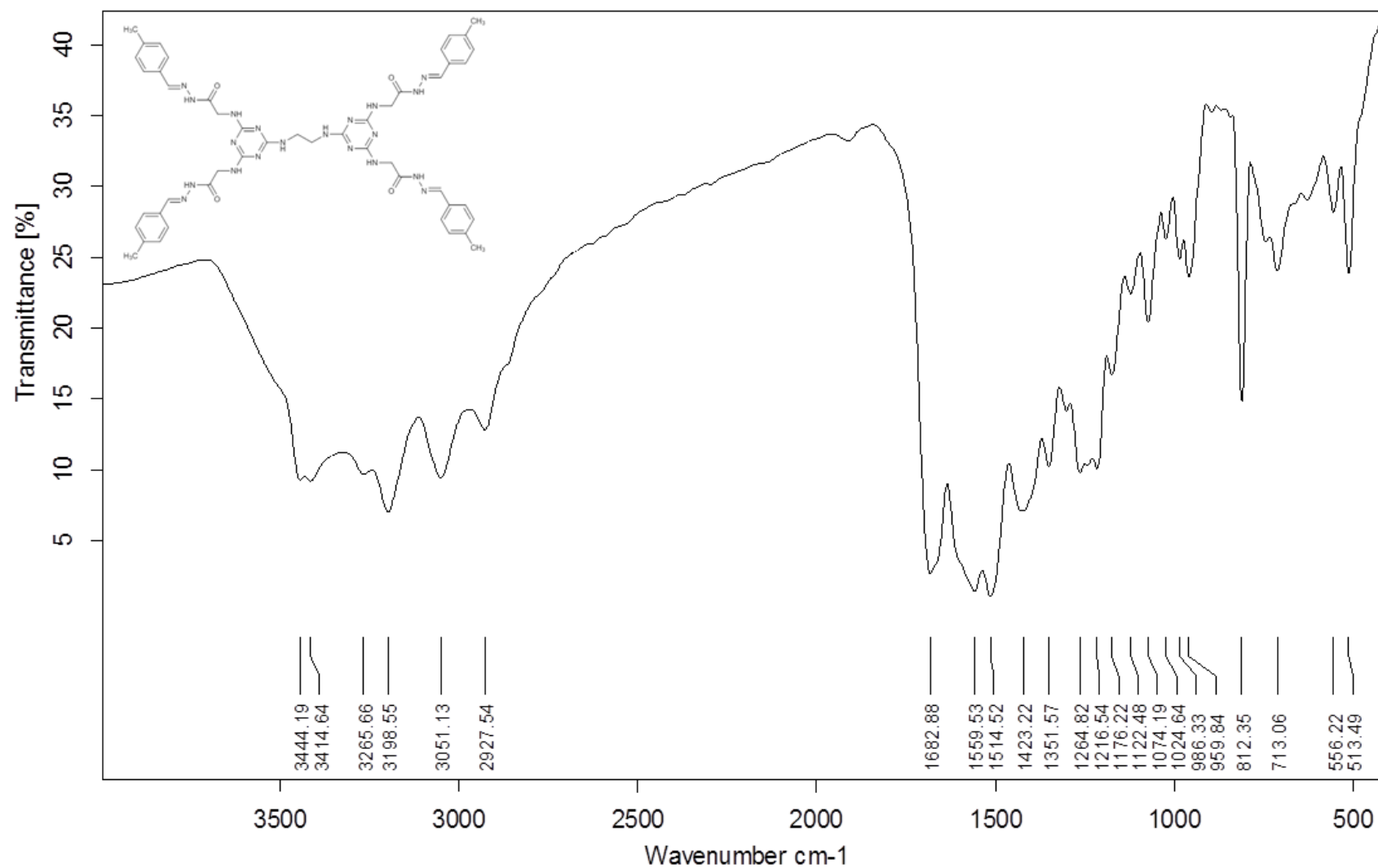


Figure 37: IR (KBr) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-methylbenzylidene)acetohydrazide) **19b**.

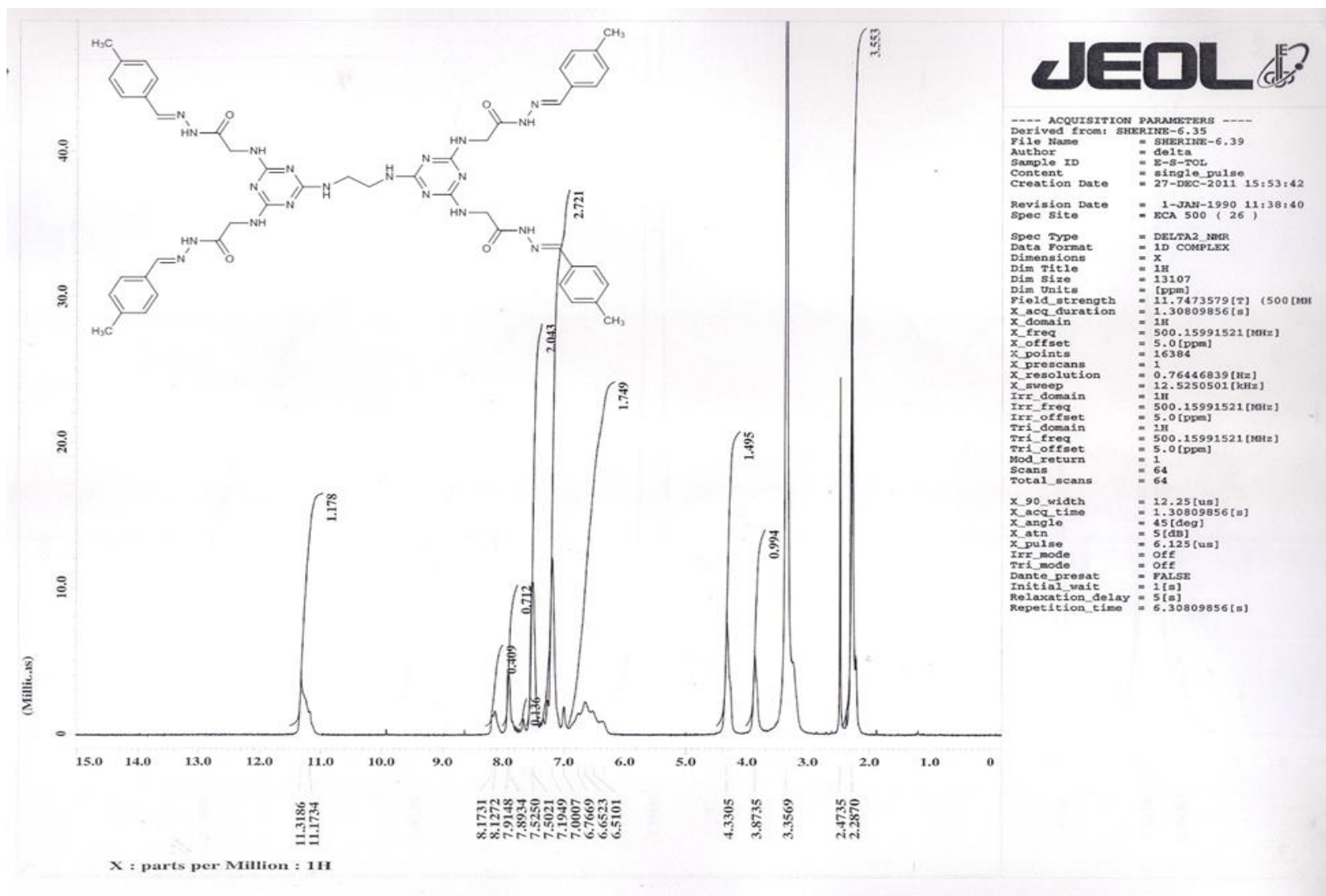


Figure 38: ^1H -NMR ($\text{DMSO-}d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-methylbenzylidene)acetohydrazide) **19b**.

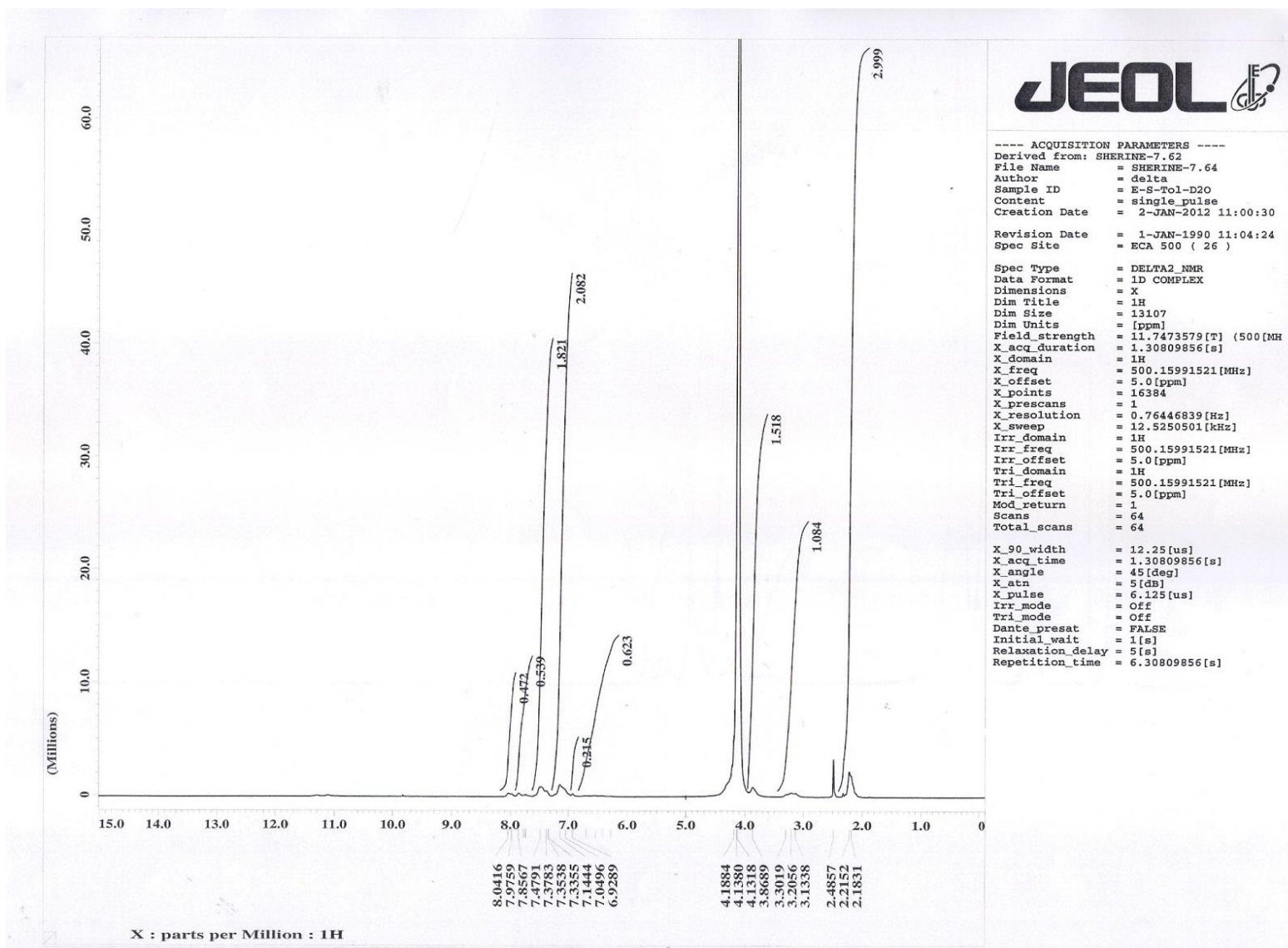


Figure 39: ^1H -NMR ($\text{DMSO}-d_6$) spectrum of $(N'E,N'''E,N''''E,N''''''E)$ -2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(N' -(4-methylbenzylidene)acetohydrazide) **19b**.

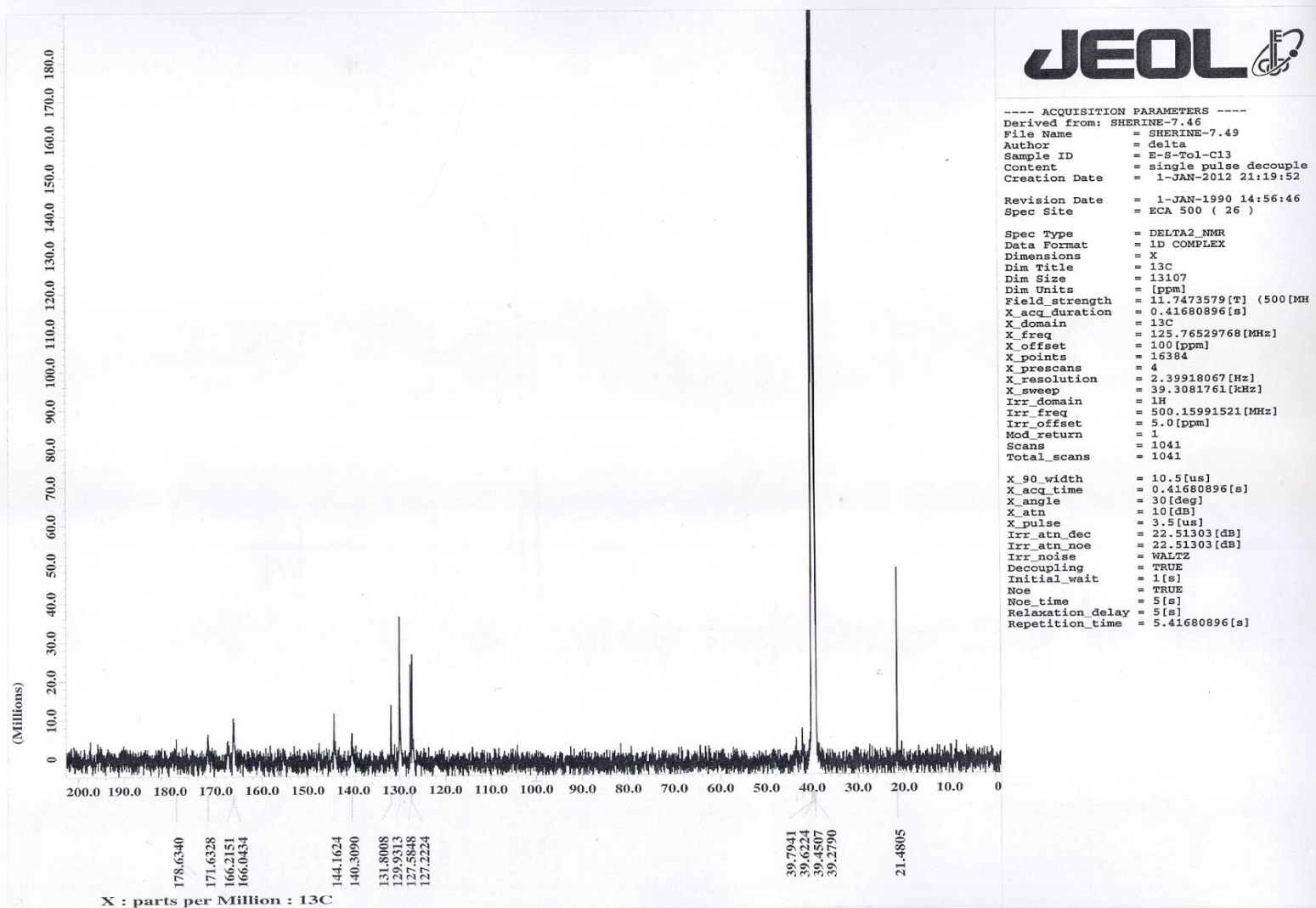


Figure 40: ^{13}C -NMR ($\text{DMSO}-d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-methylbenzylidene)acetohydrazide) **19b**.

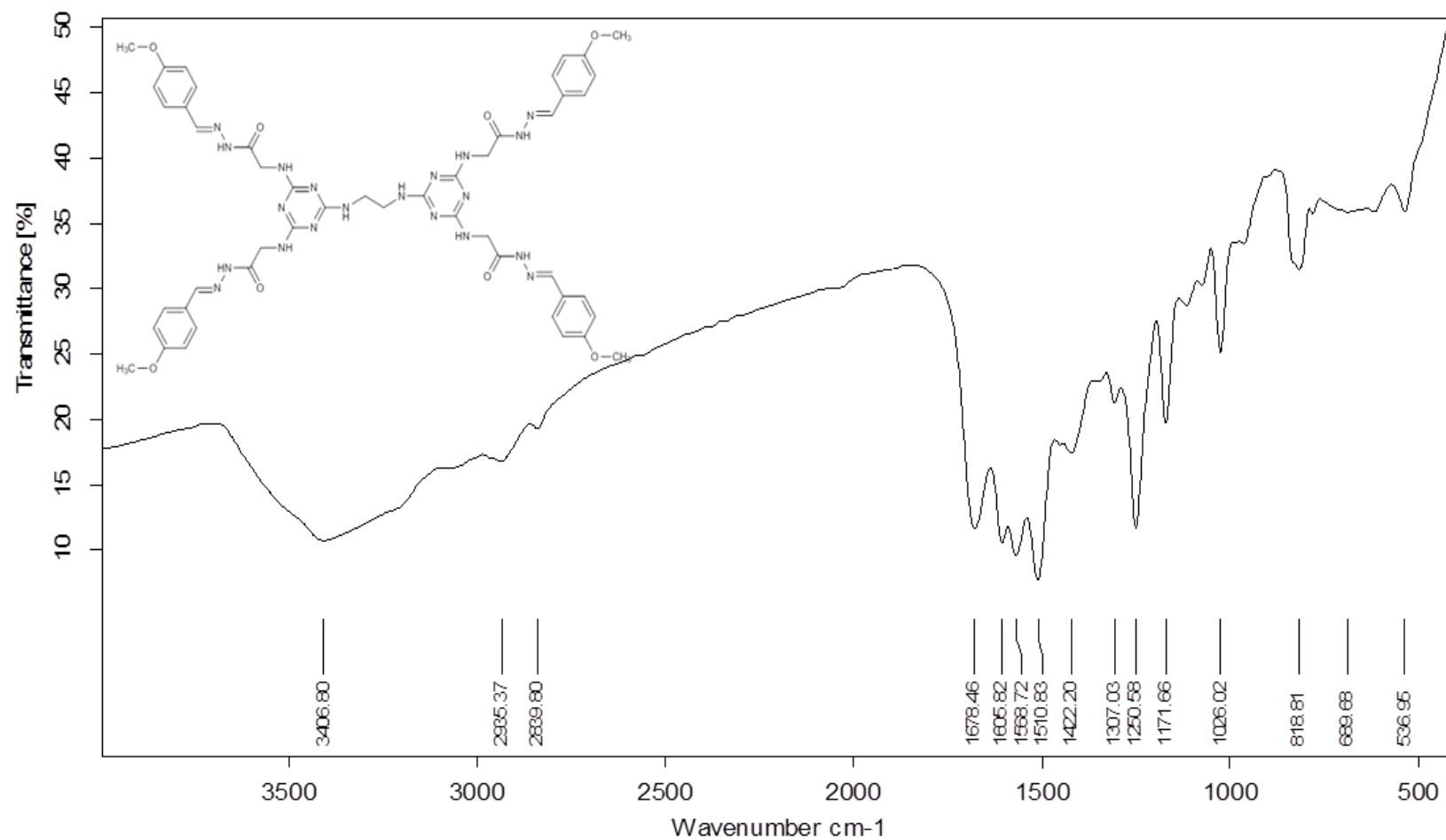


Figure 41: IR (KBr) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-methoxybenzylidene)acetohydrazide) **19c**.

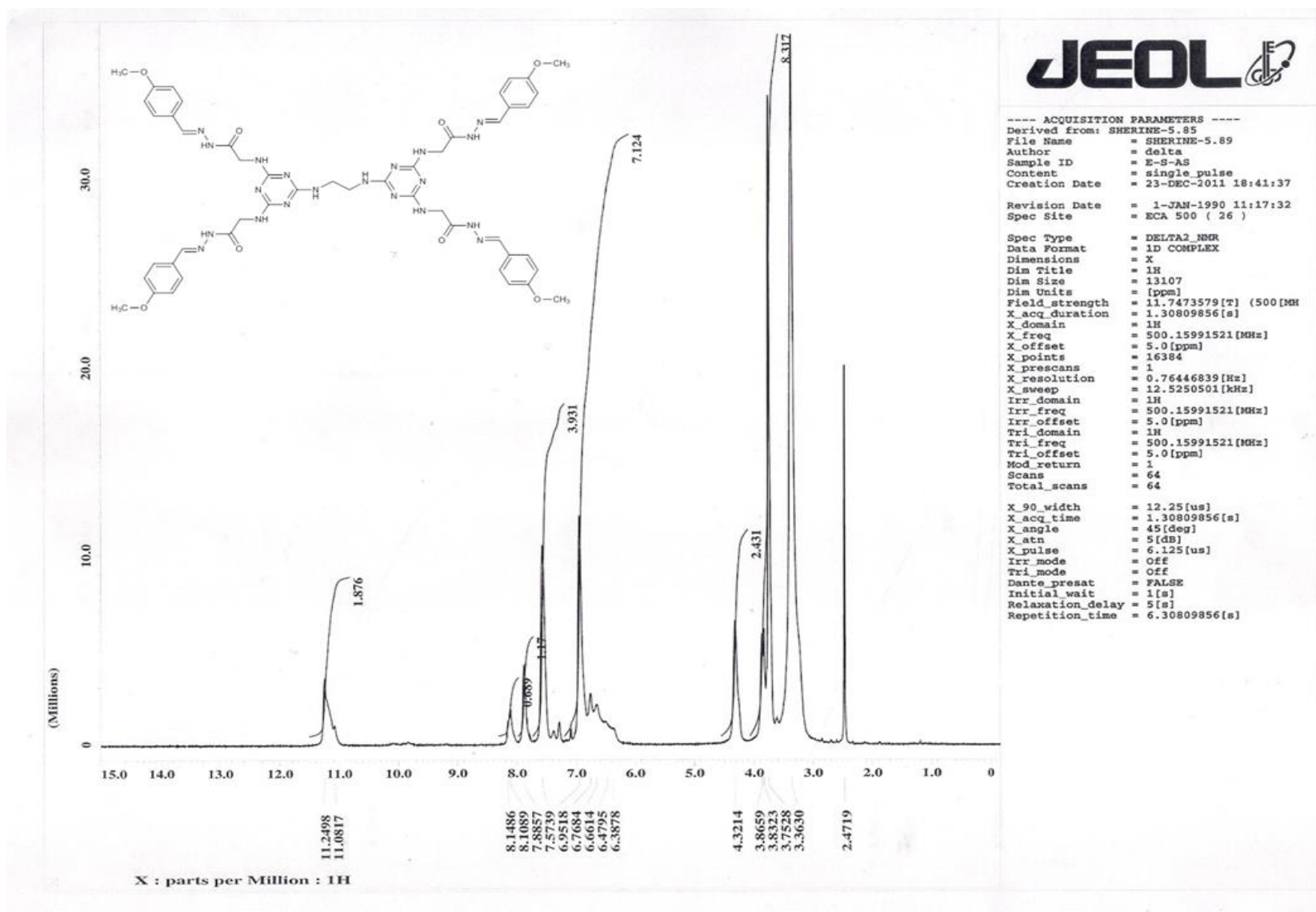


Figure 42: ^1H -NMR ($\text{DMSO}-d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-methoxybenzylidene)acetohydrazide) **19c**.

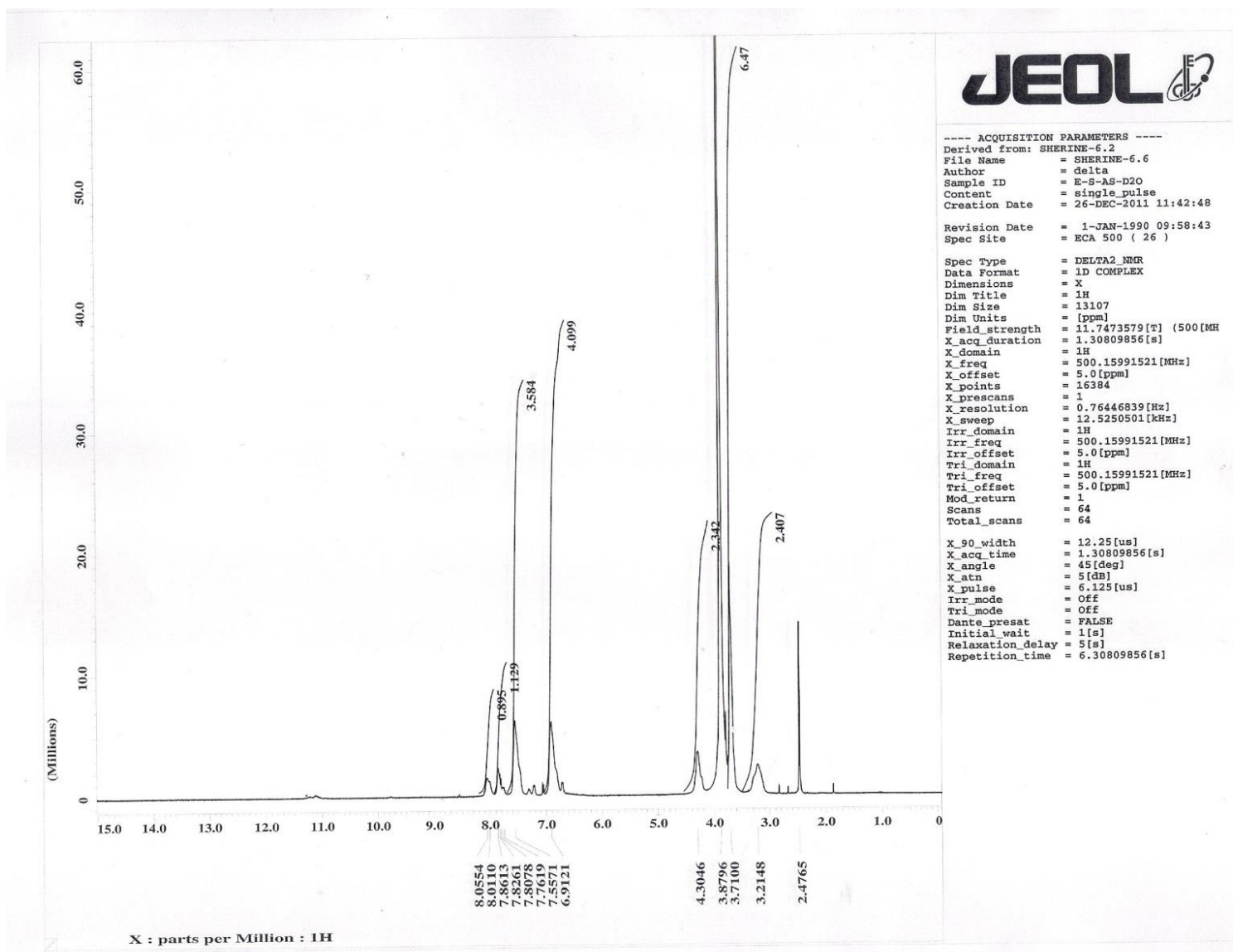


Figure 43: ^1H -NMR ($\text{DMSO}-d_6$) spectrum of ($N'E,N'''E,N''''E,N''''''E$)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(N' -(4-methoxybenzylidene)acetohydrazide) **19c**.

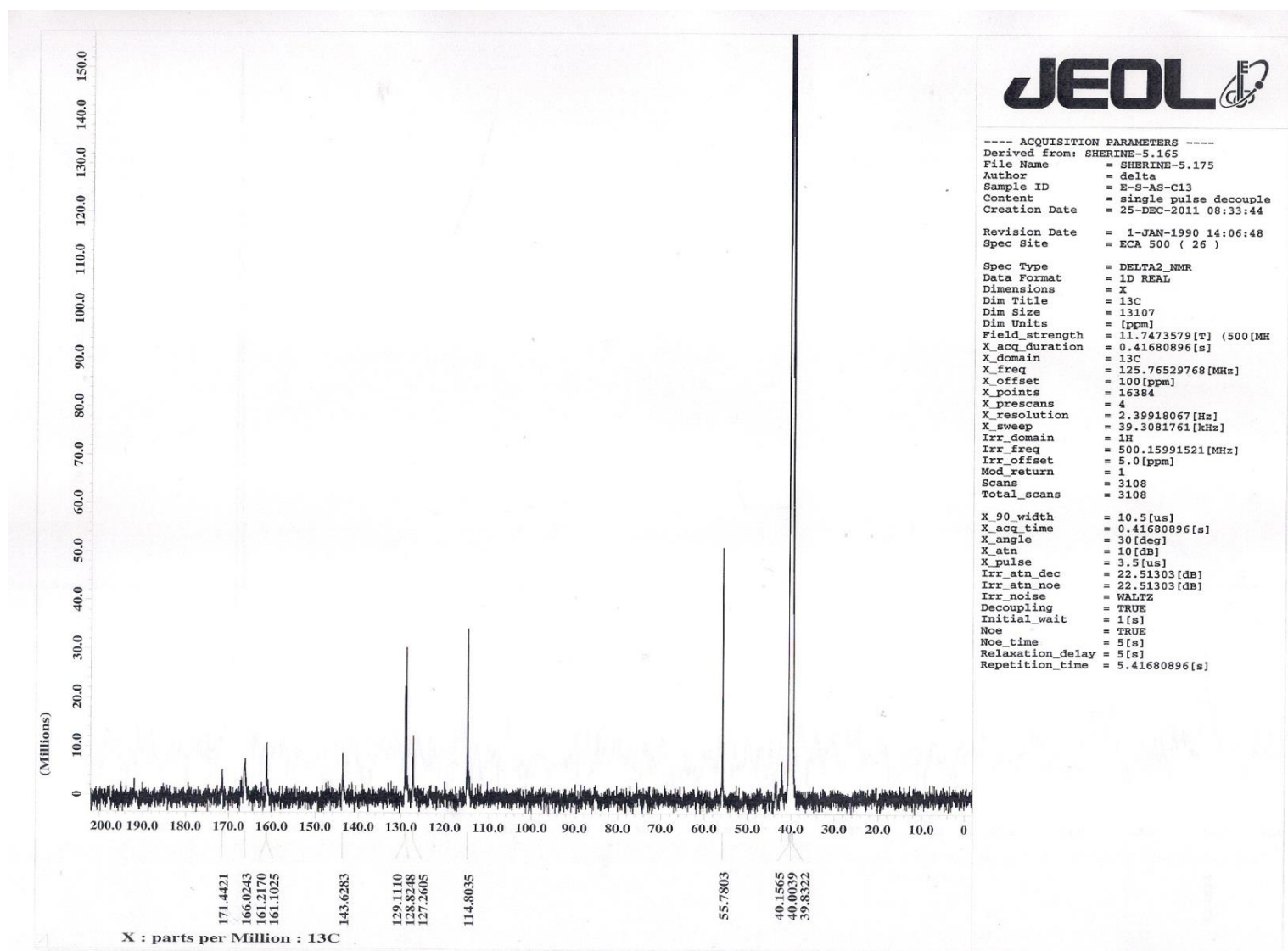


Figure 44: ^{13}C -NMR ($\text{DMSO-}d_6$) spectrum of (*N'E,N'''E,N''''E,N'''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-methoxybenzylidene)acetohydrazide) **19c**.

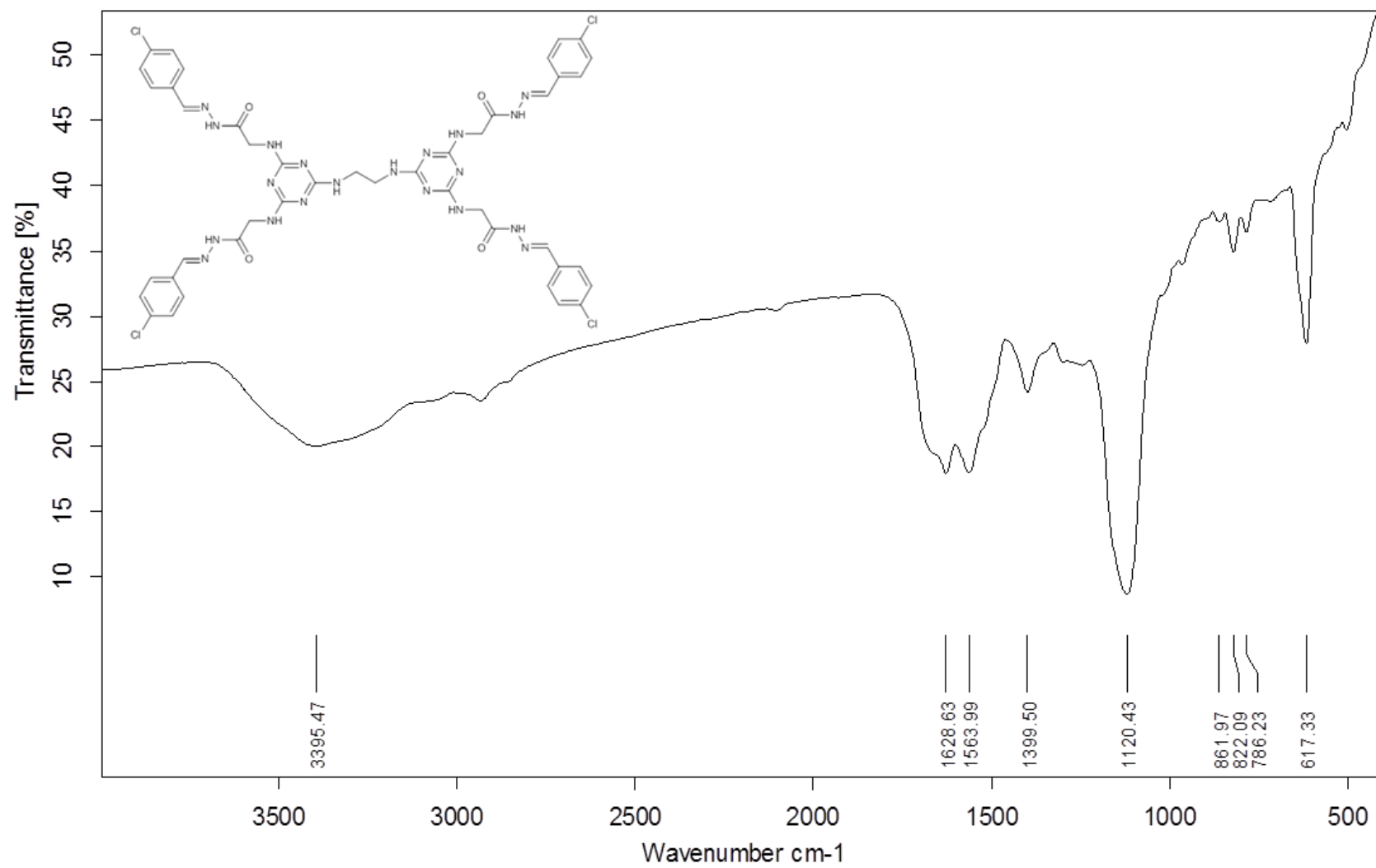


Figure 45: IR (KBr) spectrum of (*N'E,N'''E,N'''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-chlorobenzylidene)acetohydrazide) **19d**.

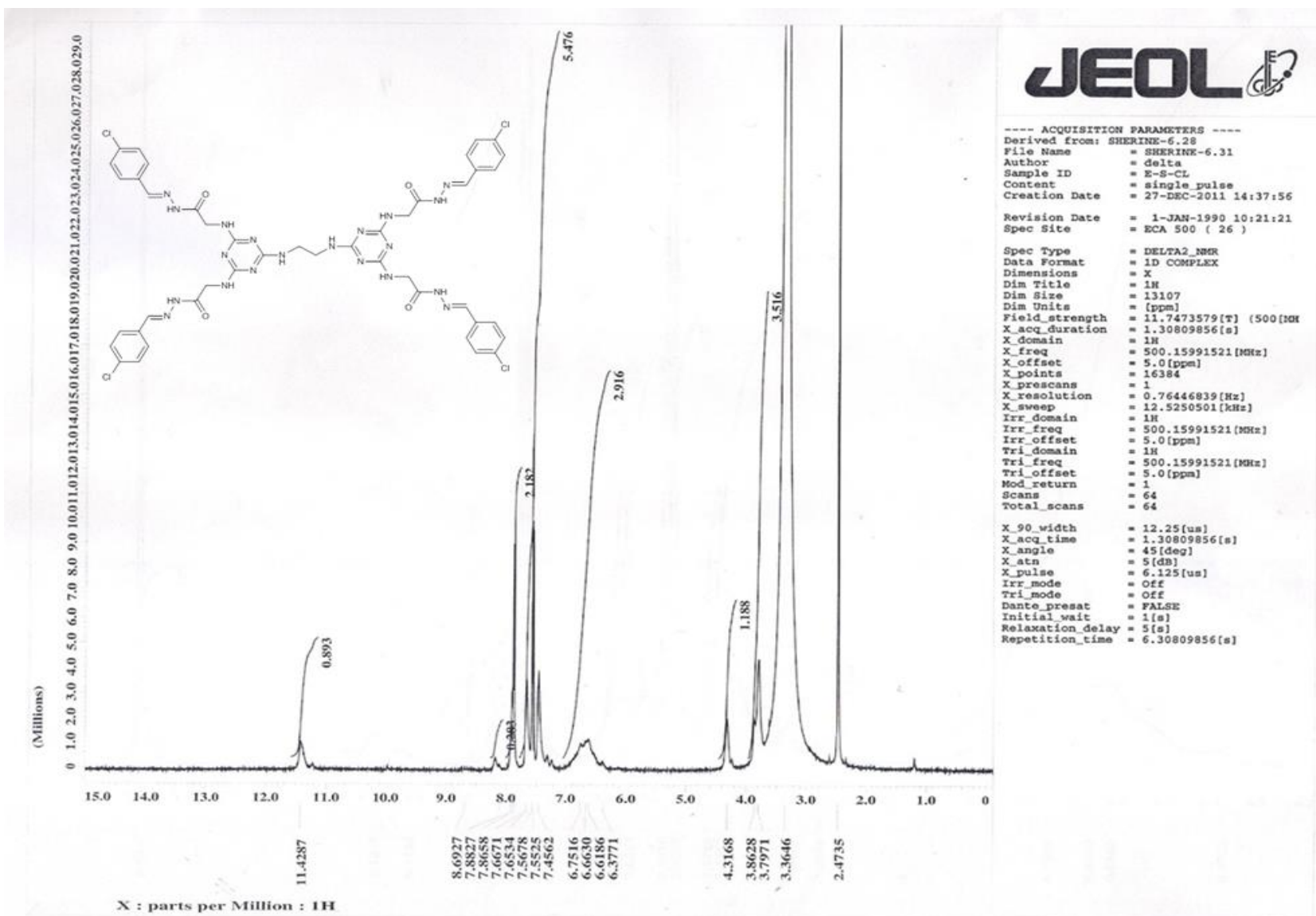


Figure 46: ^1H -NMR ($\text{DMSO}-d_6$) spectrum of (*N'E,N'''E,N''''E,N'''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-chlorobenzylidene)acetohydrazide) **19d**.

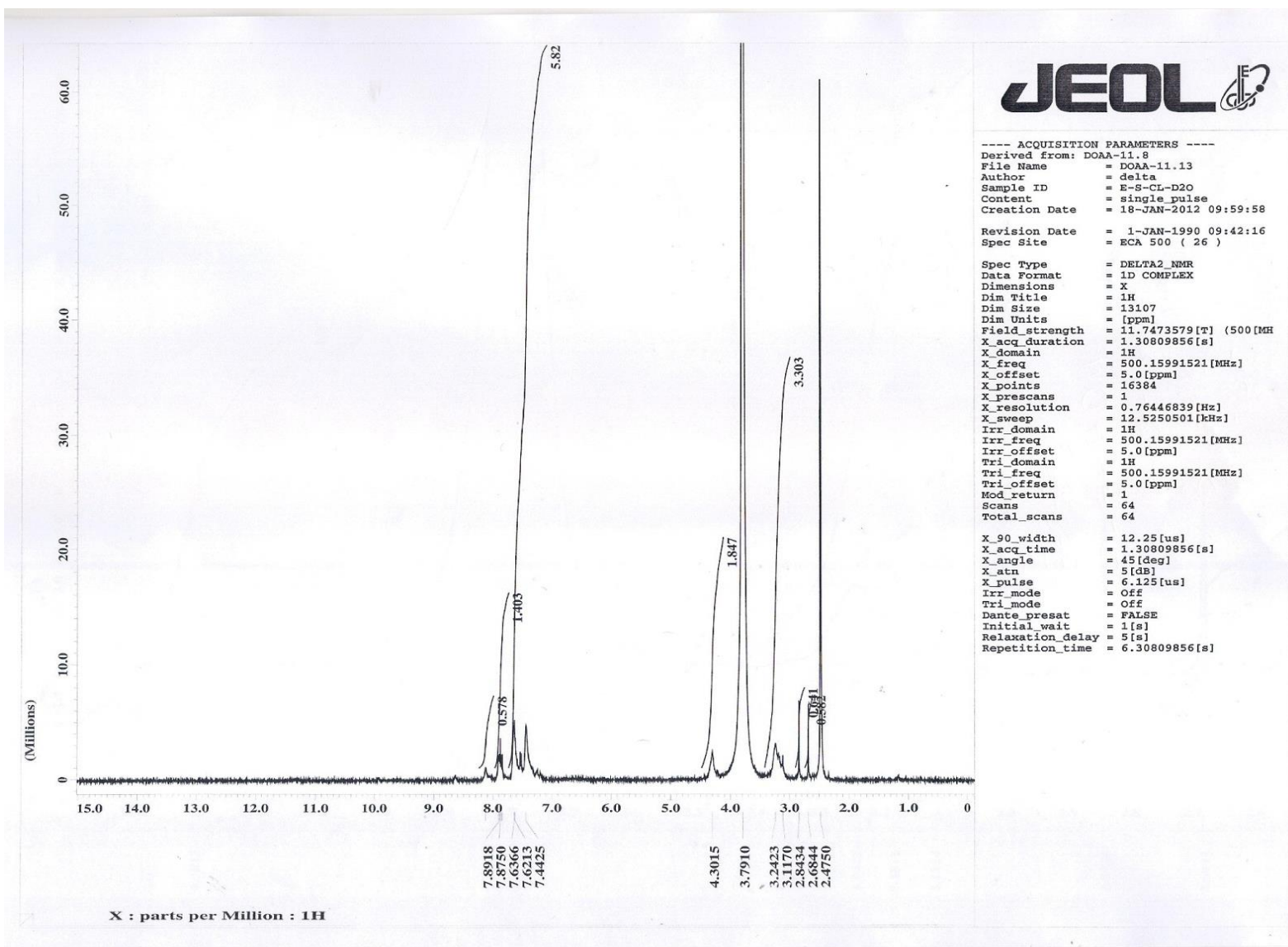


Figure 47: ^1H -NMR ($\text{DMSO}-d_6\text{D}_2\text{O}$) spectrum of ($N'E,N'''E,N''''E,N''''''E$)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(N' -(4-chlorobenzylidene)acetohydrazide) **19d**.

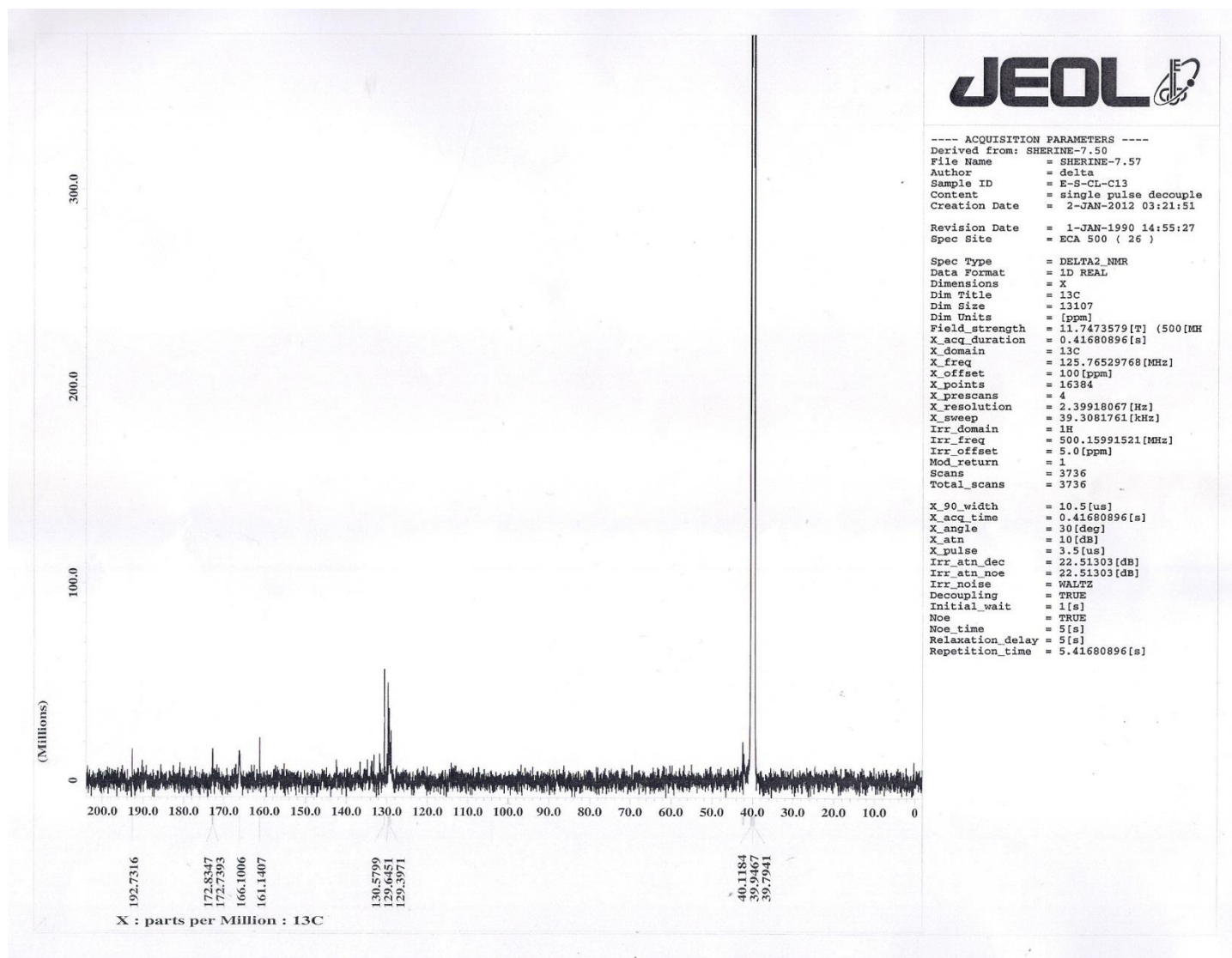


Figure 48: ^{13}C -NMR ($\text{DMSO}-d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-chlorobenzylidene)acetohydrazide) **19d**.

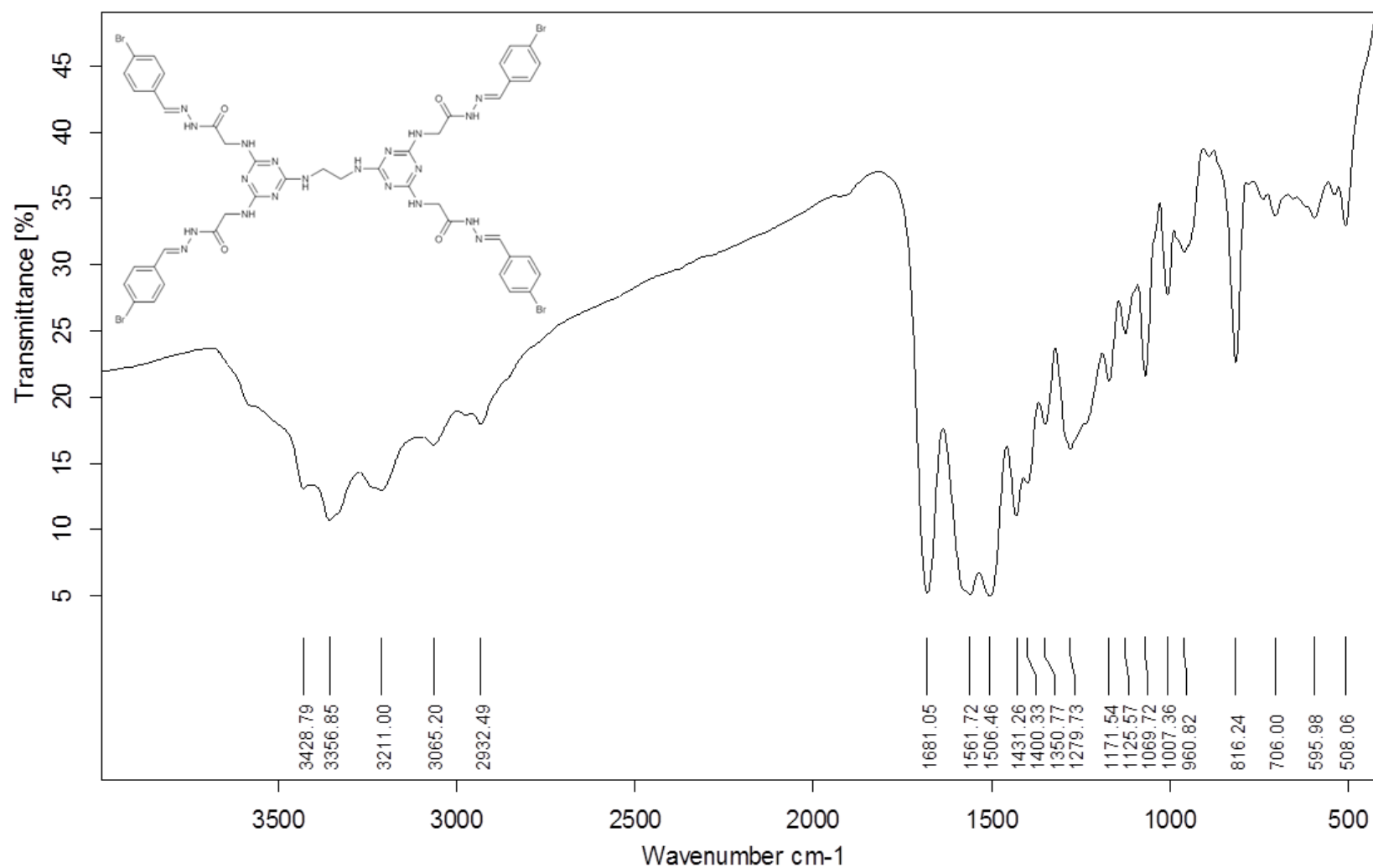


Figure 49: IR (KBr) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl)))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-bromobenzylidene)acetohydrazide) **19e**.

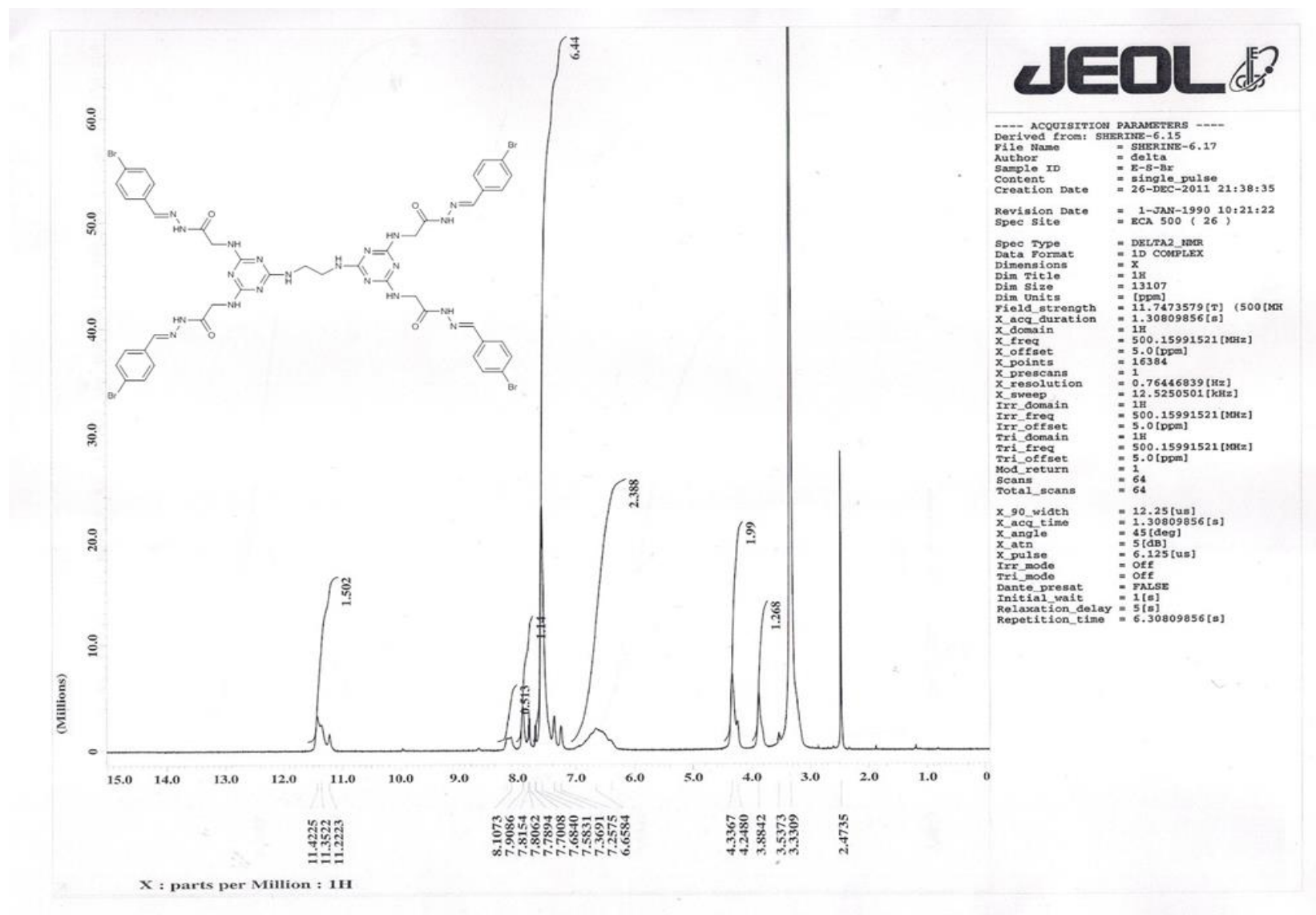


Figure 50: ¹H-NMR (DMSO-*d*₆) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-bromobenzylidene)acetohydrazide) **19e**.

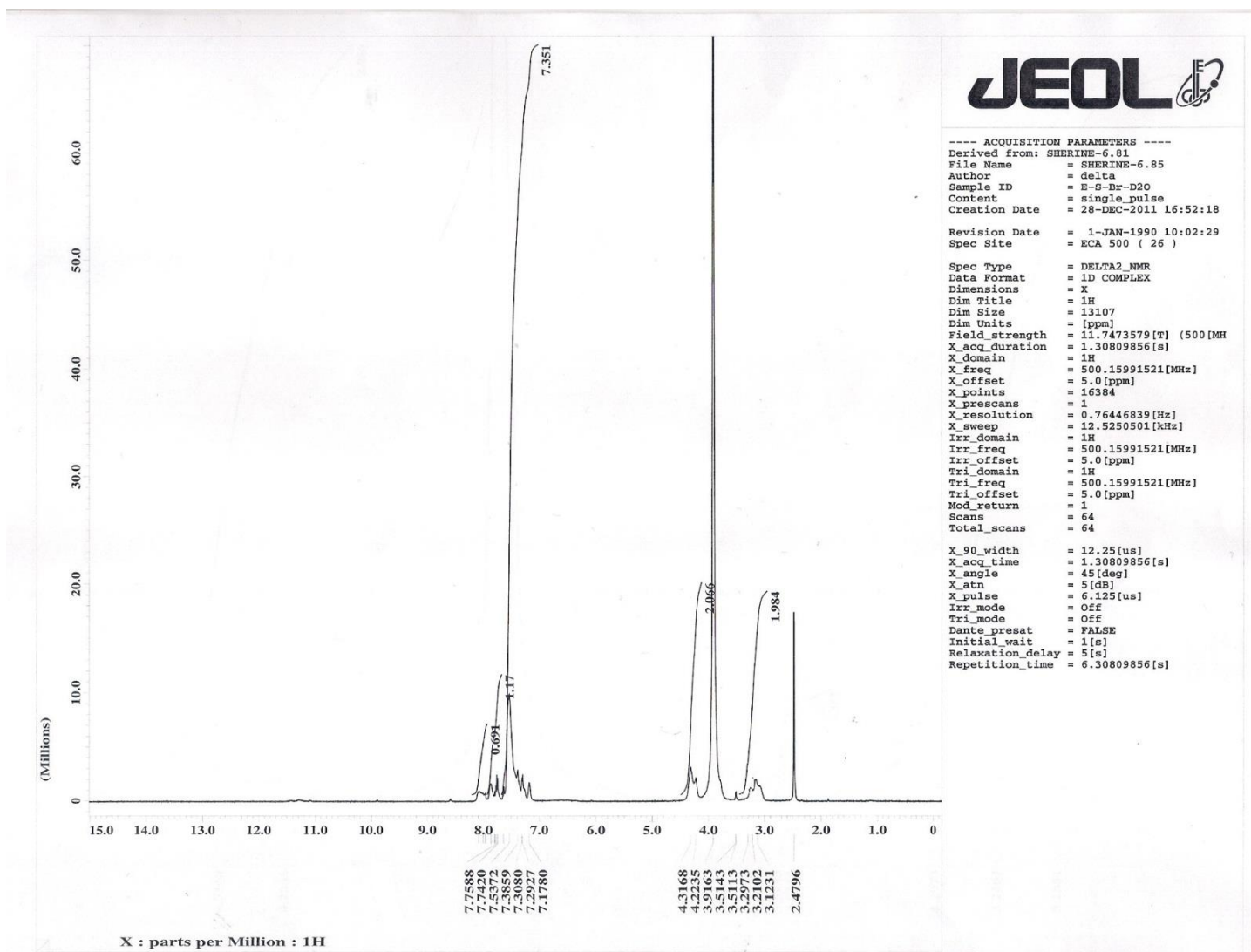


Figure 51: ^1H -NMR ($\text{DMSO}-d_6\text{D}_2\text{O}$) spectrum of ($N'E,N'''E,N''''E,N''''''E$)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(N' -(4-bromobenzylidene)acetohydrazide) **19e**.

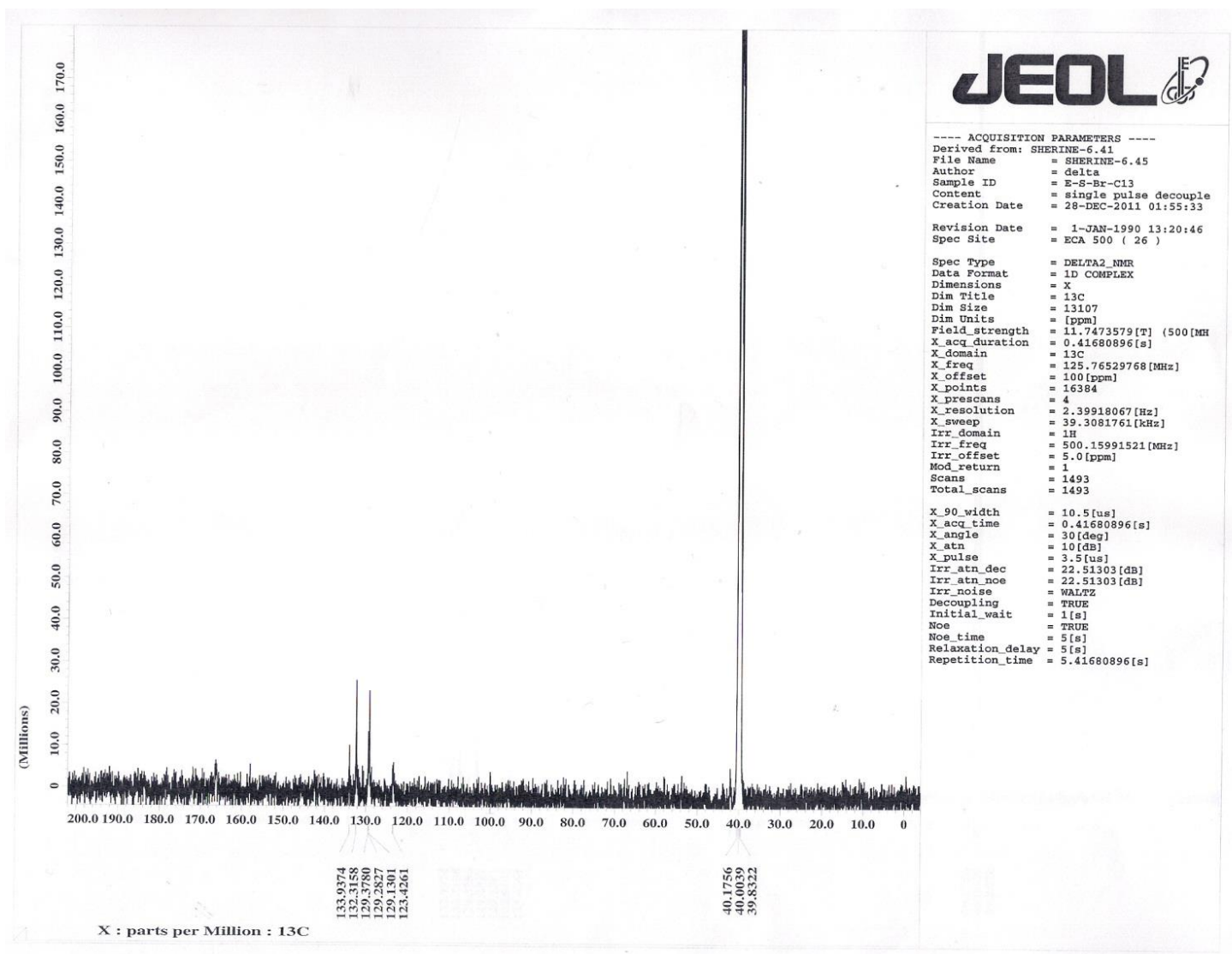


Figure 52: ^{13}C -NMR ($\text{DMSO-}d_6$) spectrum of (*N'E,N'''E,N''''E,N'''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-bromobenzylidene)acetohydrazide) **19e**.

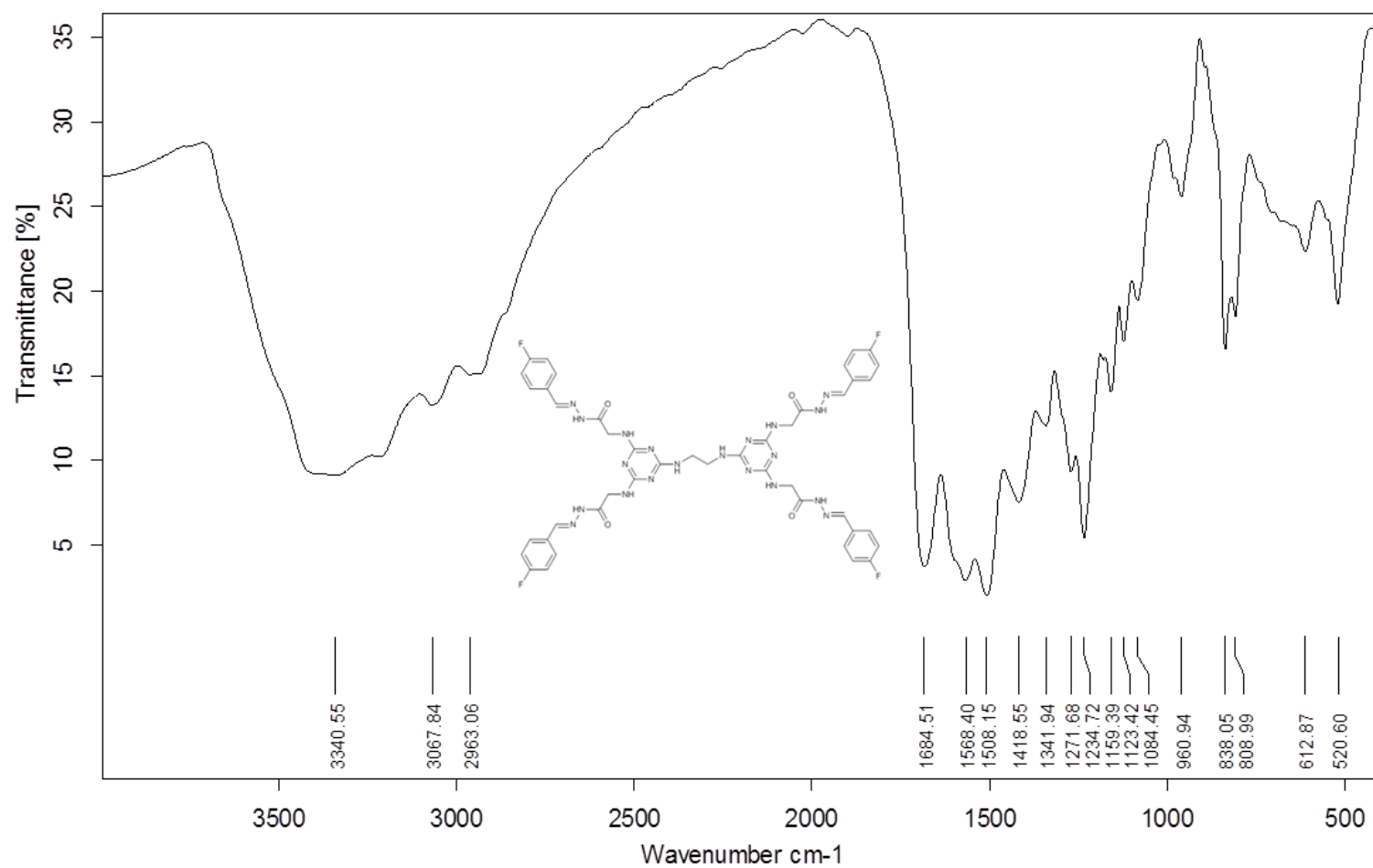


Figure 53: IR (KBr) spectrum of (*N'E,N'''E,N''''E,N'''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-fluorobenzylidene)acetohydrazide) **19f**.

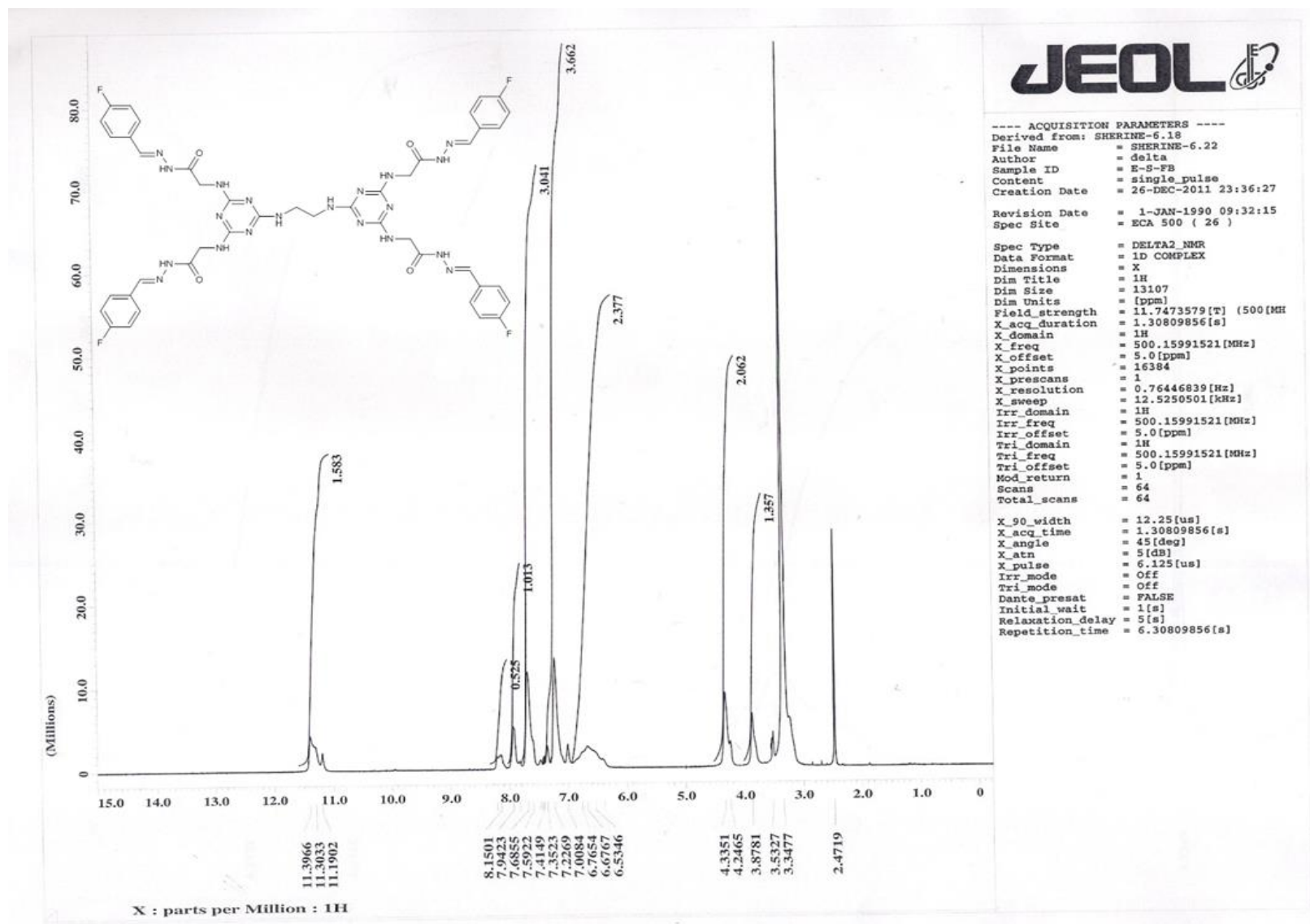


Figure 54: ^1H -NMR ($\text{DMSO-}d_6$) spectrum of (*N'E,N'''E,N''''E,N'''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-fluorobenzylidene)acetohydrazide) **19f**.

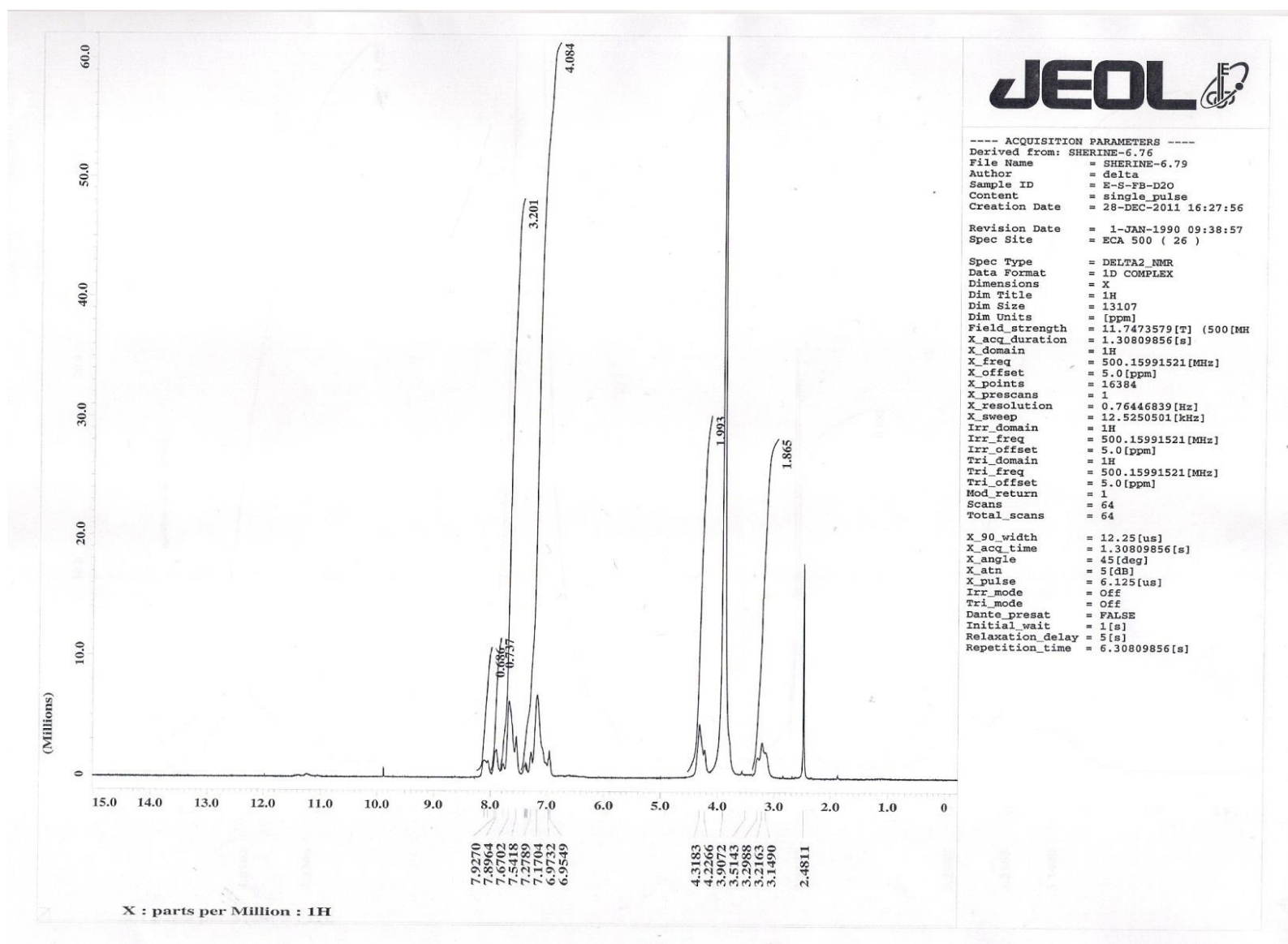


Figure 55: ^1H -NMR ($\text{DMSO-}d_6$) spectrum of ($N'E,N'''E,N''''E,N''''''E$)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(N' -(4-fluorobenzylidene)acetohydrazide) **19f**.

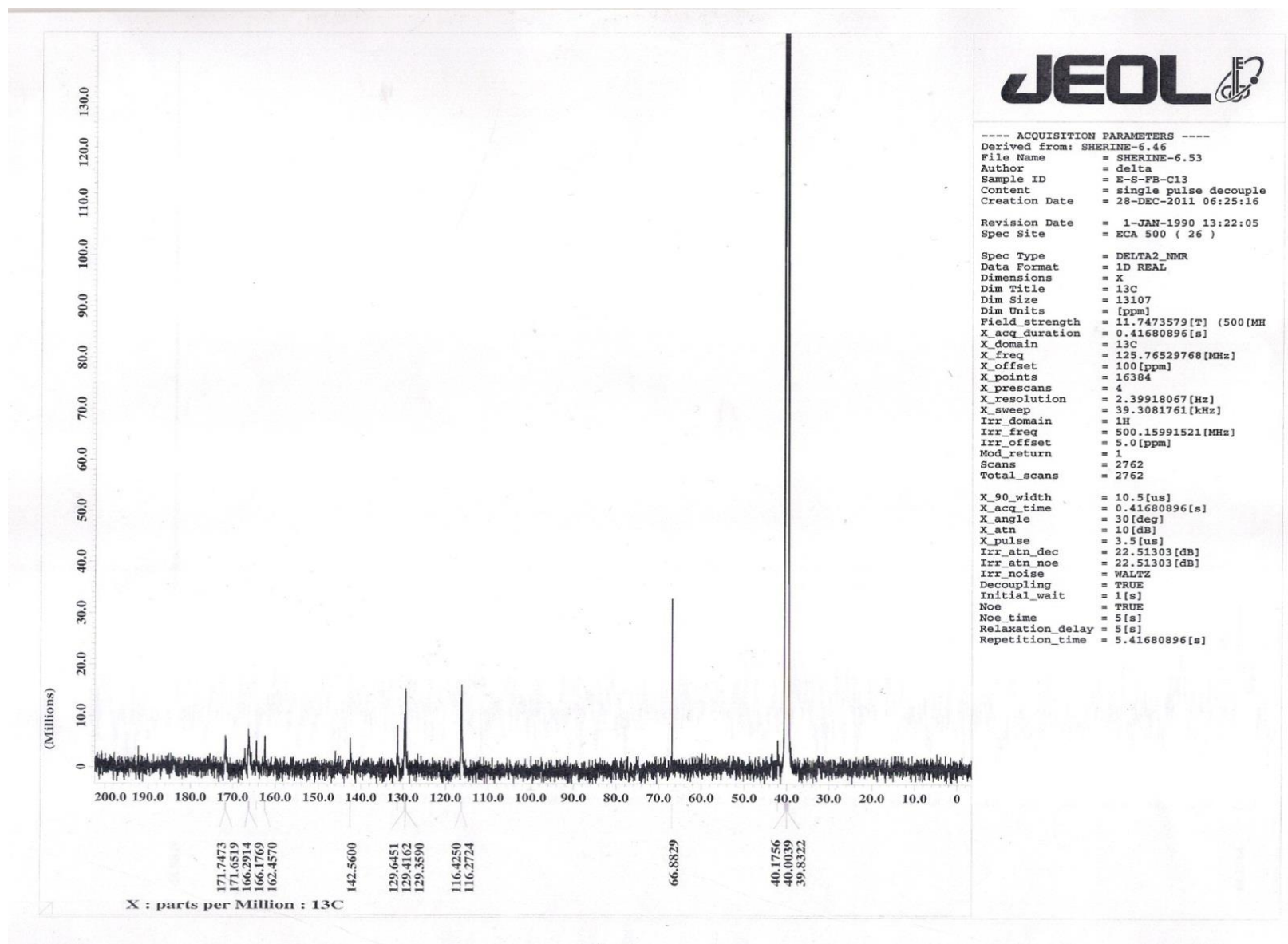


Figure 56: ^{13}C -NMR ($\text{DMSO}-d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-fluorobenzylidene)acetohydrazide) **19f**.

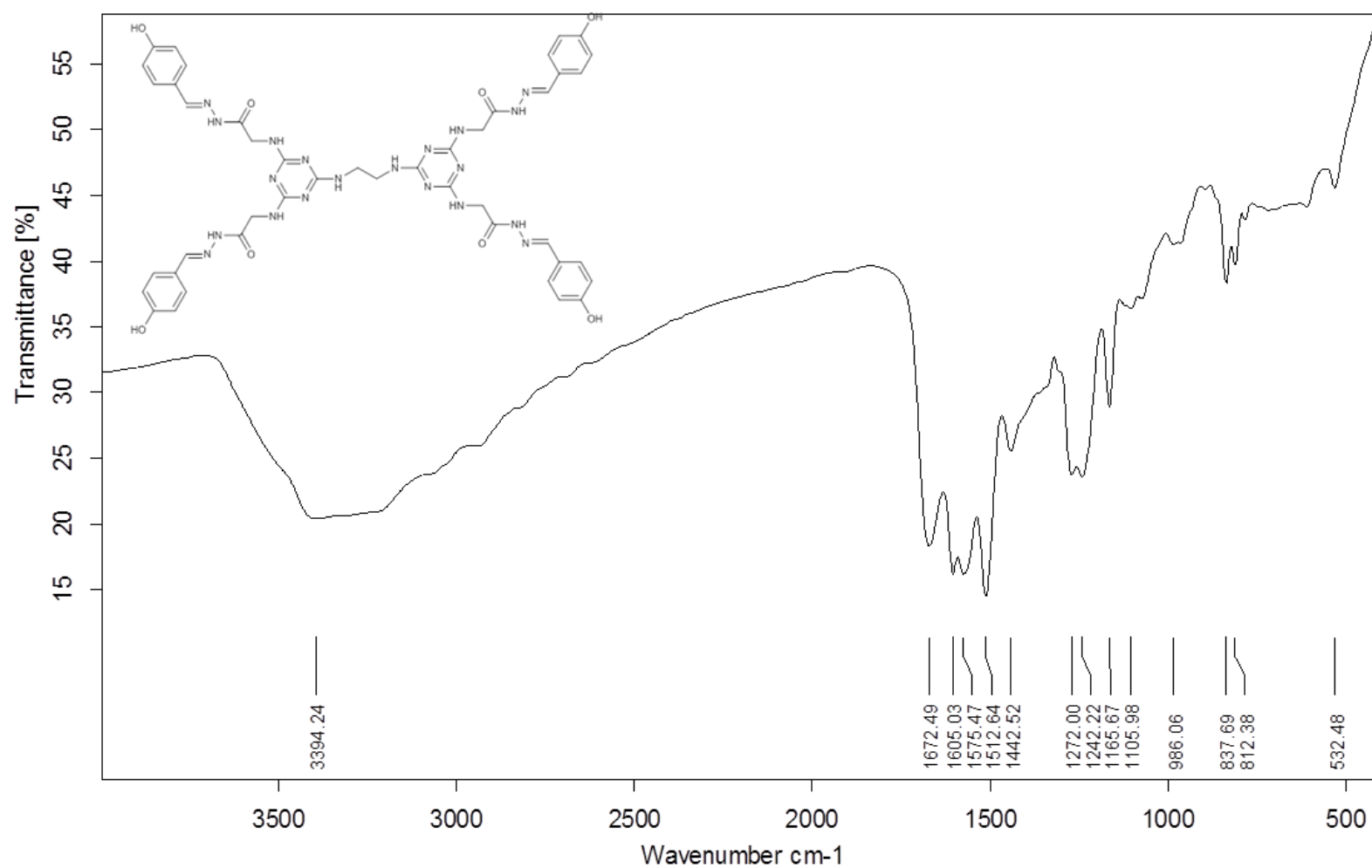


Figure 57: IR (KBr) spectrum of (*N'E,N'''E,N'''''E,N''''''E*)-2,2',2'',2'''-(((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-hydroxybenzylidene)acetohydrazide) **19g**.

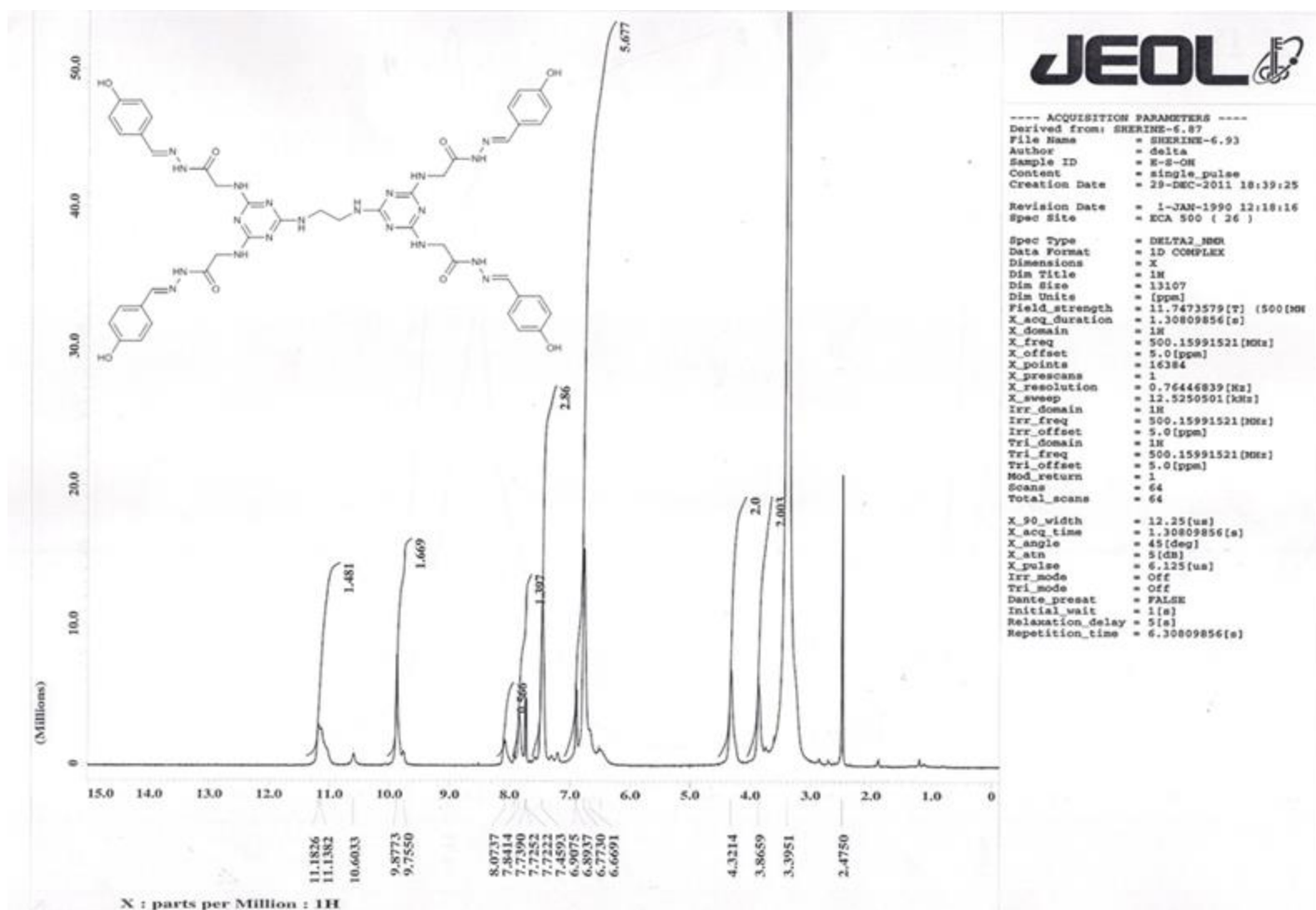


Figure 58: ^1H -NMR ($\text{DMSO}-d_6$) spectrum of ($N'E,N'''E,N''''E,N''''''E$)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(N' -(4-hydroxybenzylidene)acetohydrazide) **19g**.

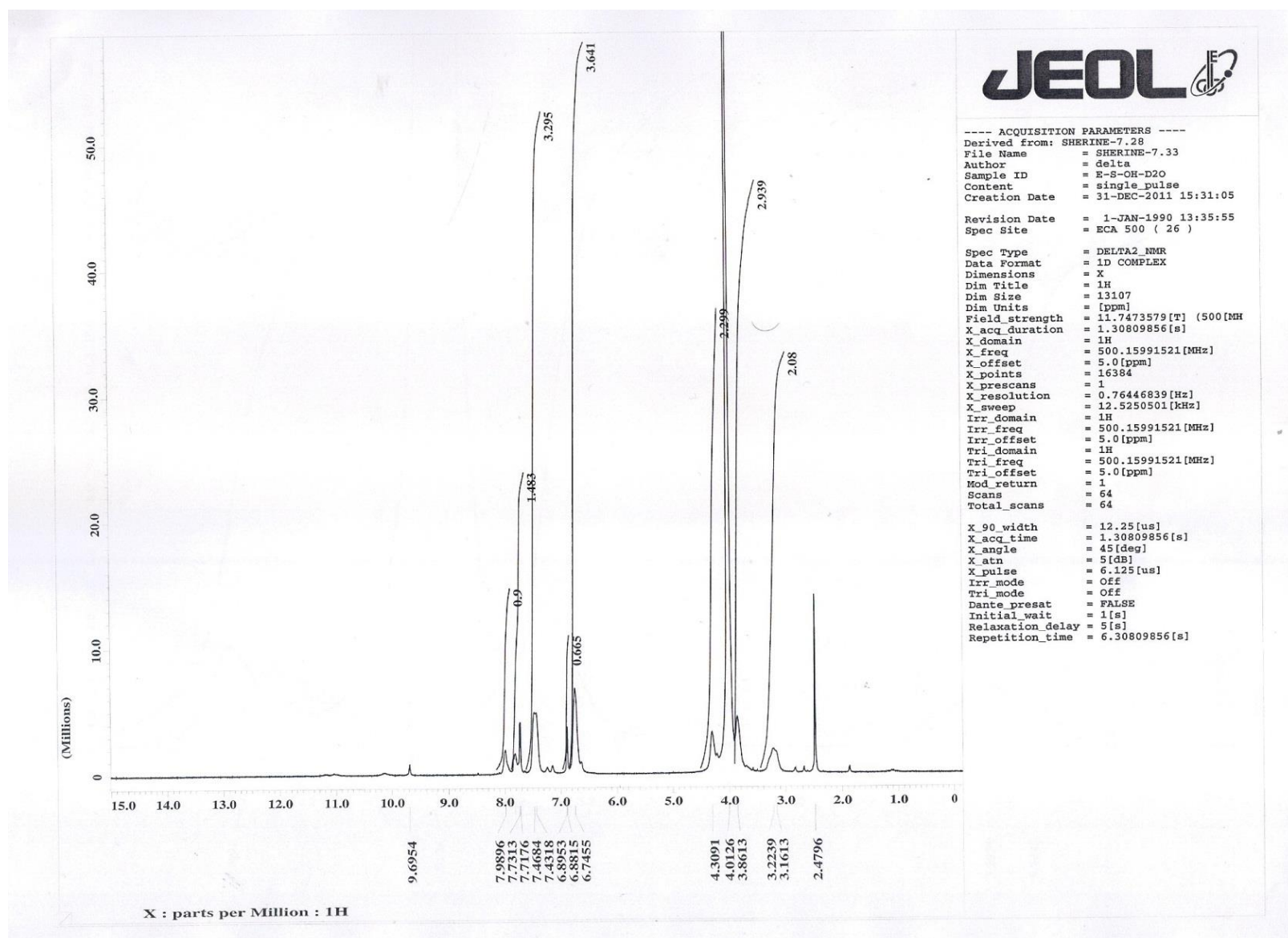


Figure 59: ^1H -NMR ($\text{DMSO}-d_6$) spectrum of $(N'E,N'''E,N''''E,N''''''E)$ -2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(N' -(4-hydroxybenzylidene)acetohydrazide) **19g**.

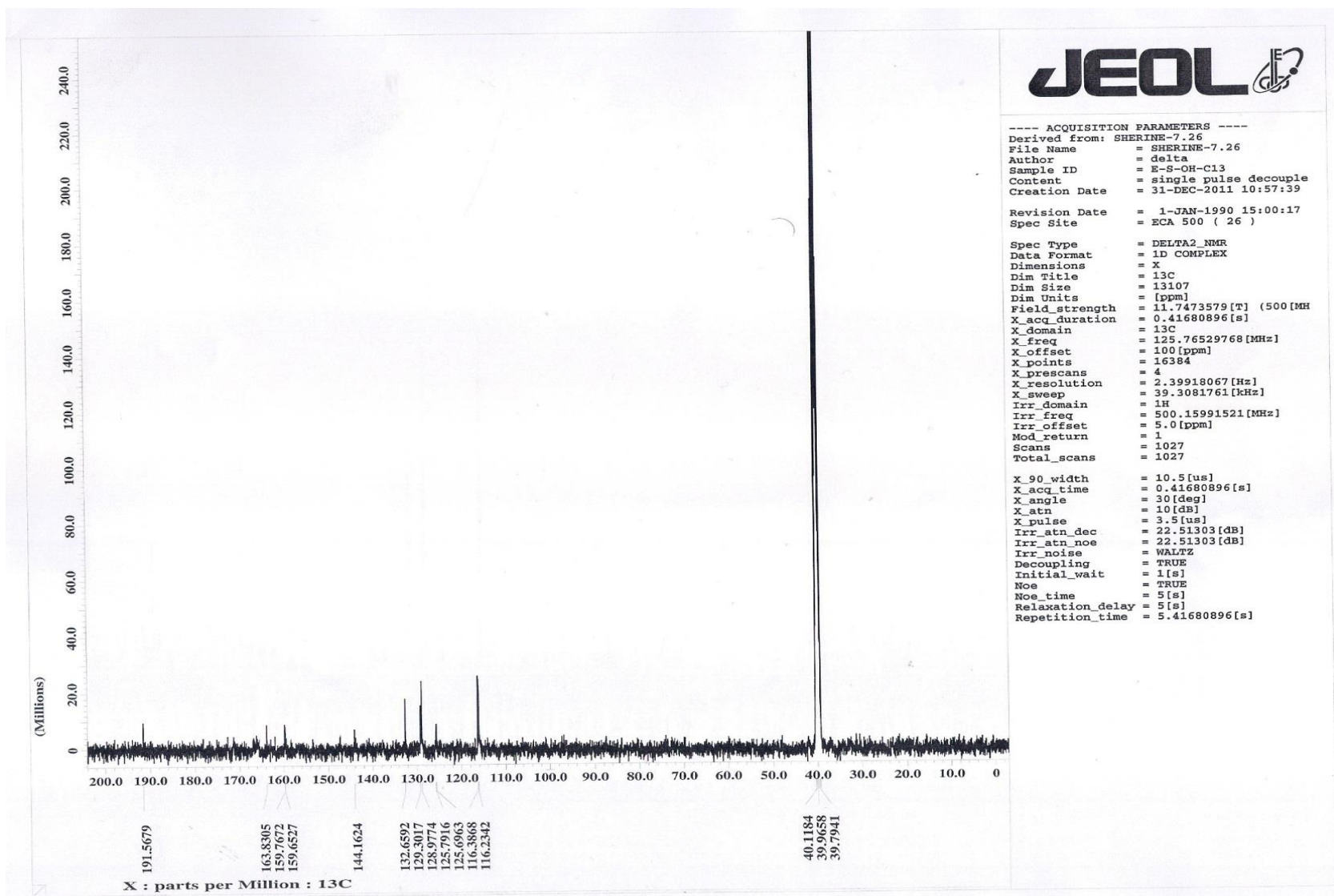


Figure 60: ^{13}C -NMR (DMSO- d_6) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-hydroxybenzylidene)acetohydrazide) **19g**.

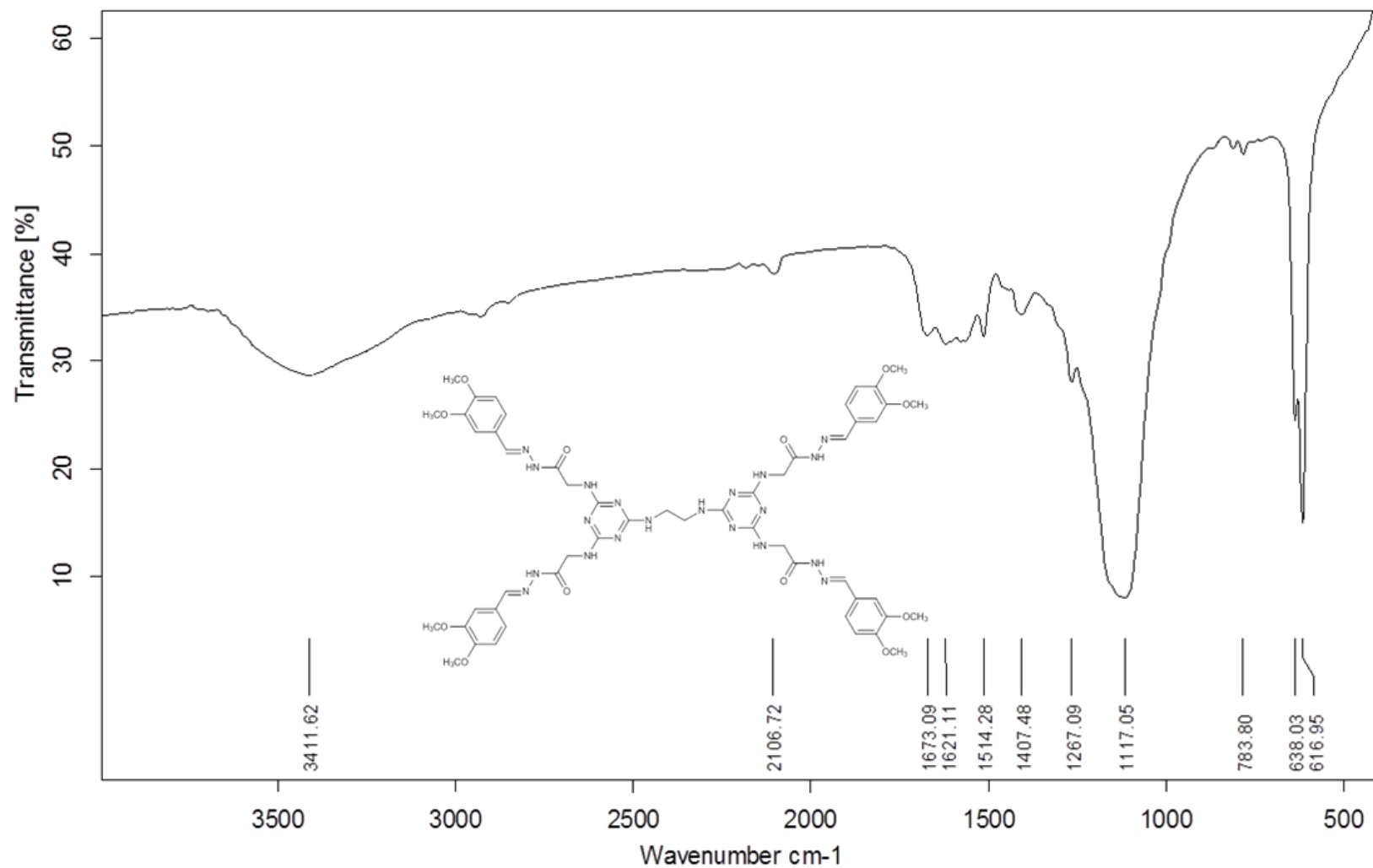


Figure 61: IR (KBr) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(3,4-dimethoxybenzylidene)acetohydrazide) **19h**.

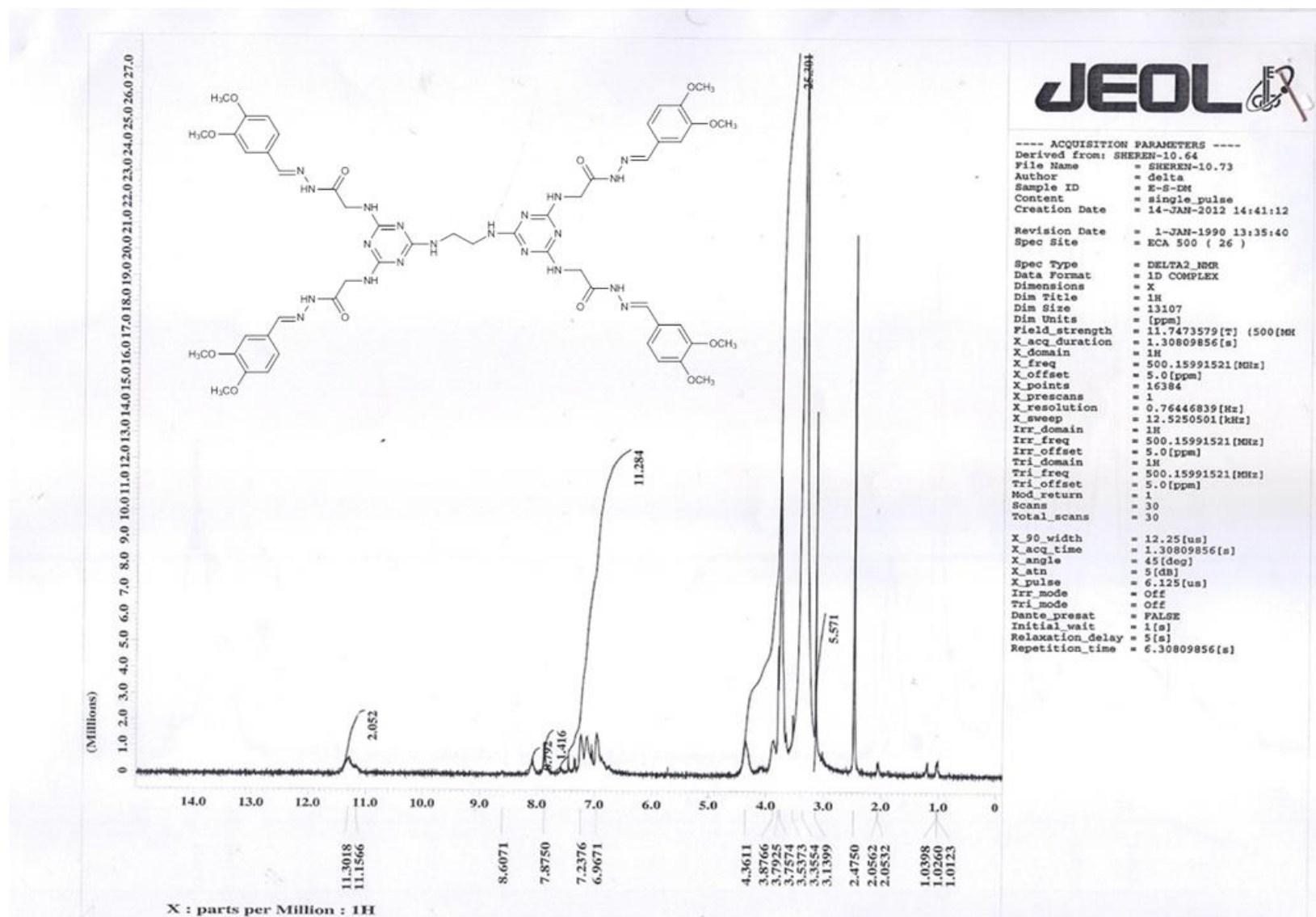


Figure 62: ¹H-NMR (DMSO-*d*₆) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(3,4-dimethoxybenzylidene)acetohydrazide **19h**.

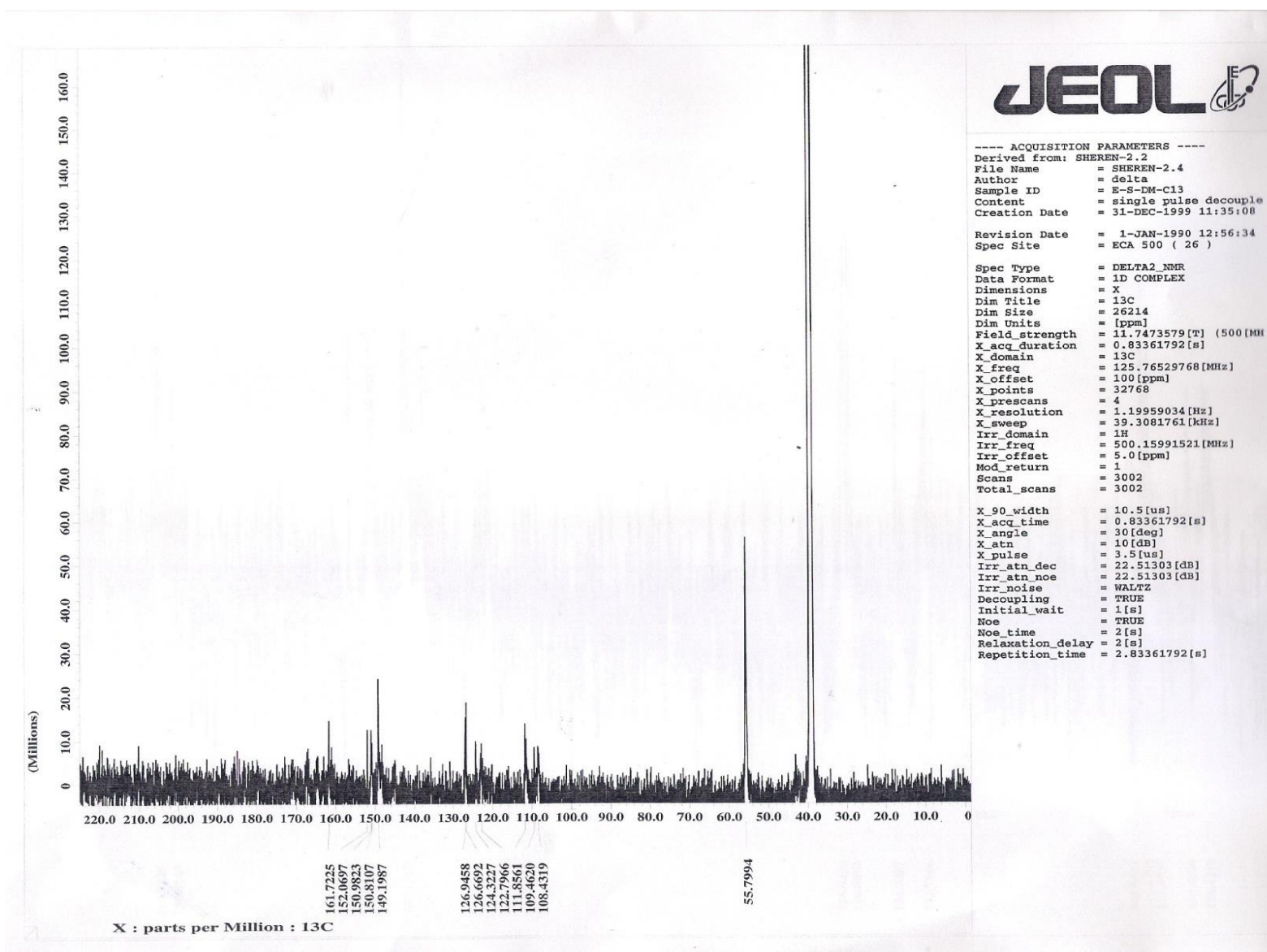


Figure 63: ^{13}C -NMR ($\text{DMSO}-d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(3,4-dimethoxybenzylidene)acetohydrazide **19h**.

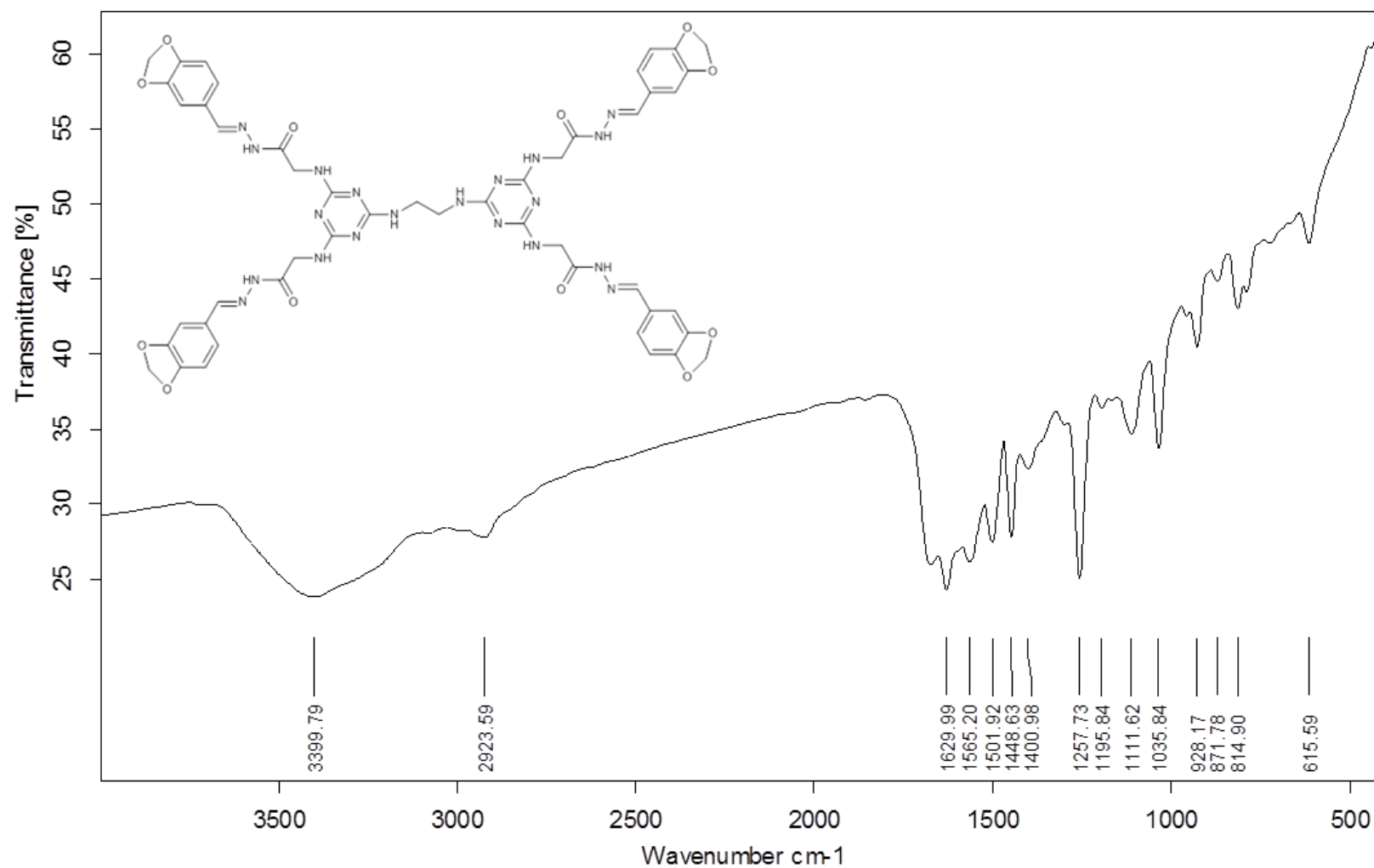


Figure 64: IR (KBr) spectrum of (*N'E,N'''E,N'''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(benzo[d][1,3]dioxol-5-ylmethylene)acetohydrazide) **19i**.

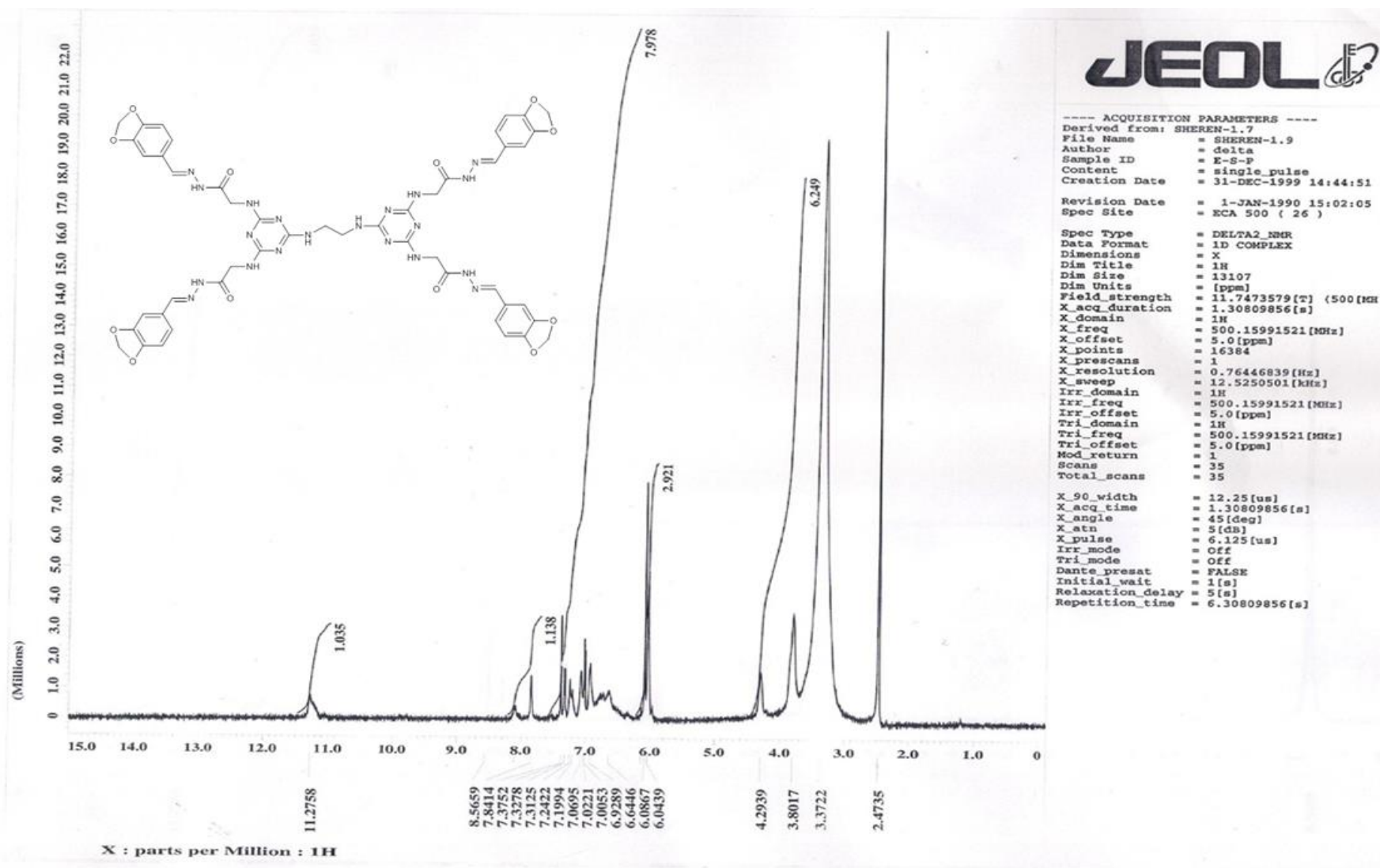


Figure 65: ^1H -NMR ($\text{DMSO}-d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(benzo[d][1,3]dioxol-5-ylmethylene)acetohydrazide) **19i**.

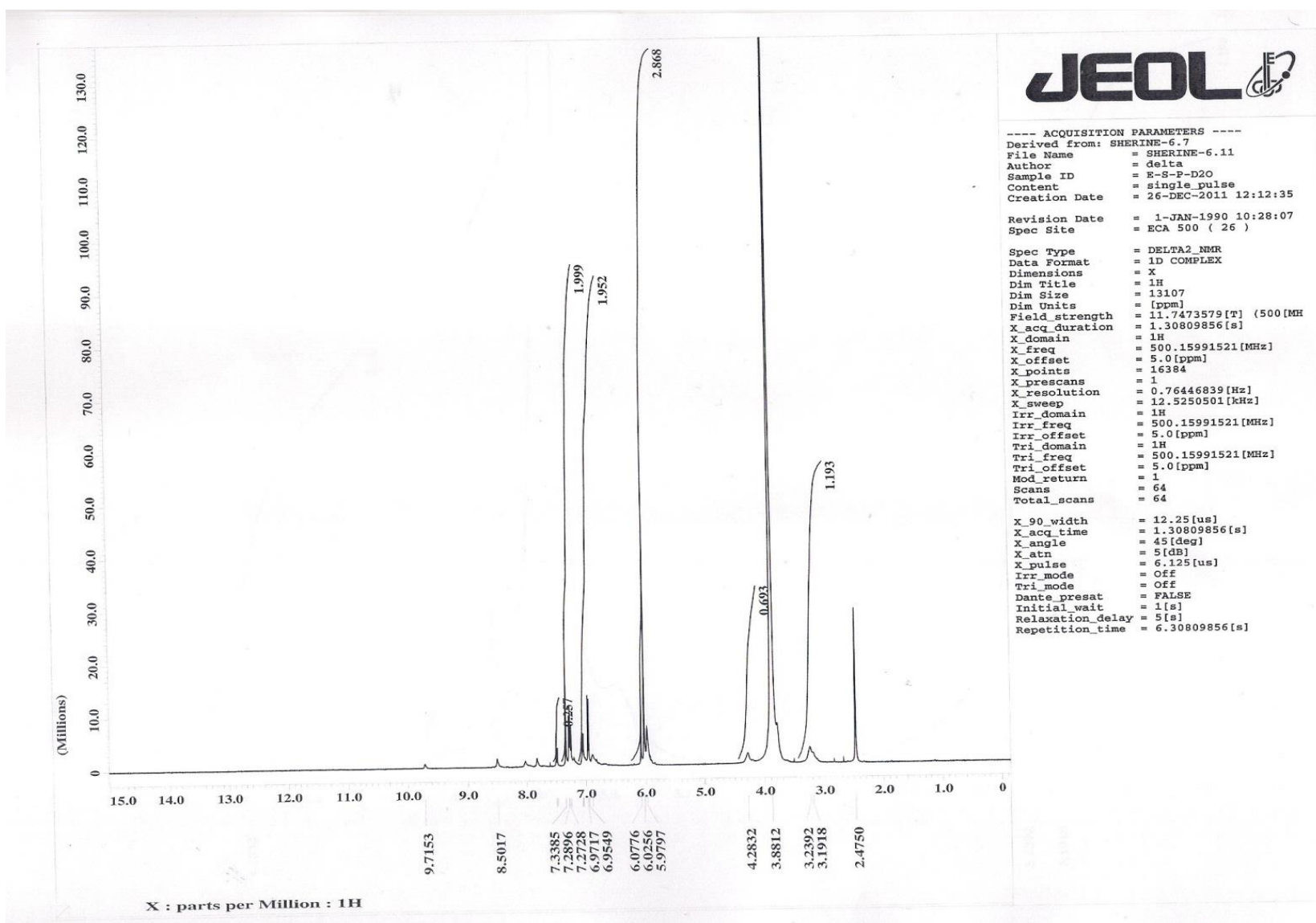


Figure 66: ^1H -NMR ($\text{DMSO}-d_6$) spectrum of $(N'E,N'''E,N''''E,N''''''E)$ -2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(N' -(benzo[d][1,3]dioxol-5-ylmethylene)acetohydrazide) **19i**.

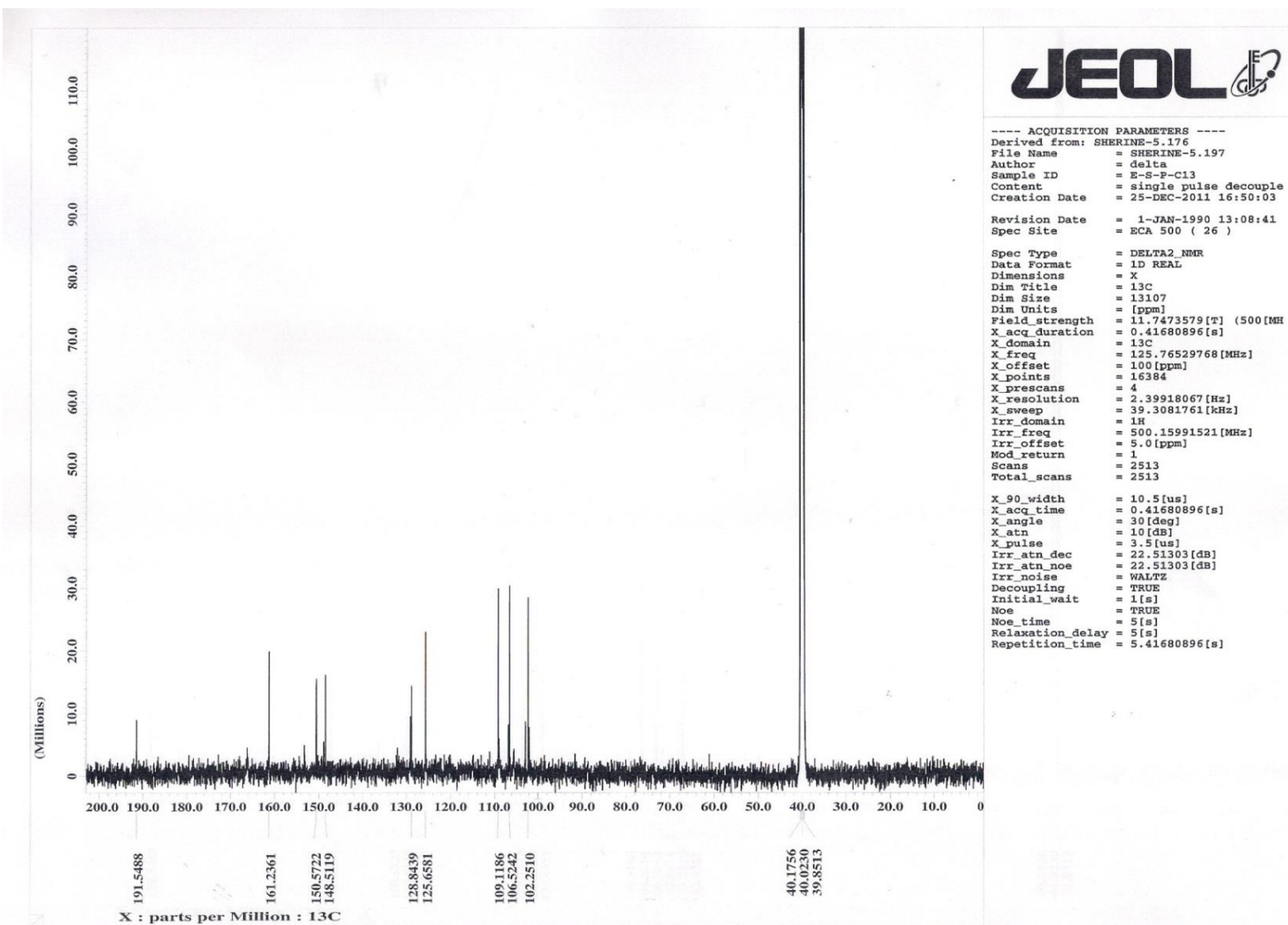


Figure 67: ^{13}C -NMR ($\text{DMSO}-d_6$) spectrum of (*N'E,N'''E,N''''E,N'''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(benzo[d][1,3]dioxol-5-ylmethylene)acetohydrazide) **19i**.

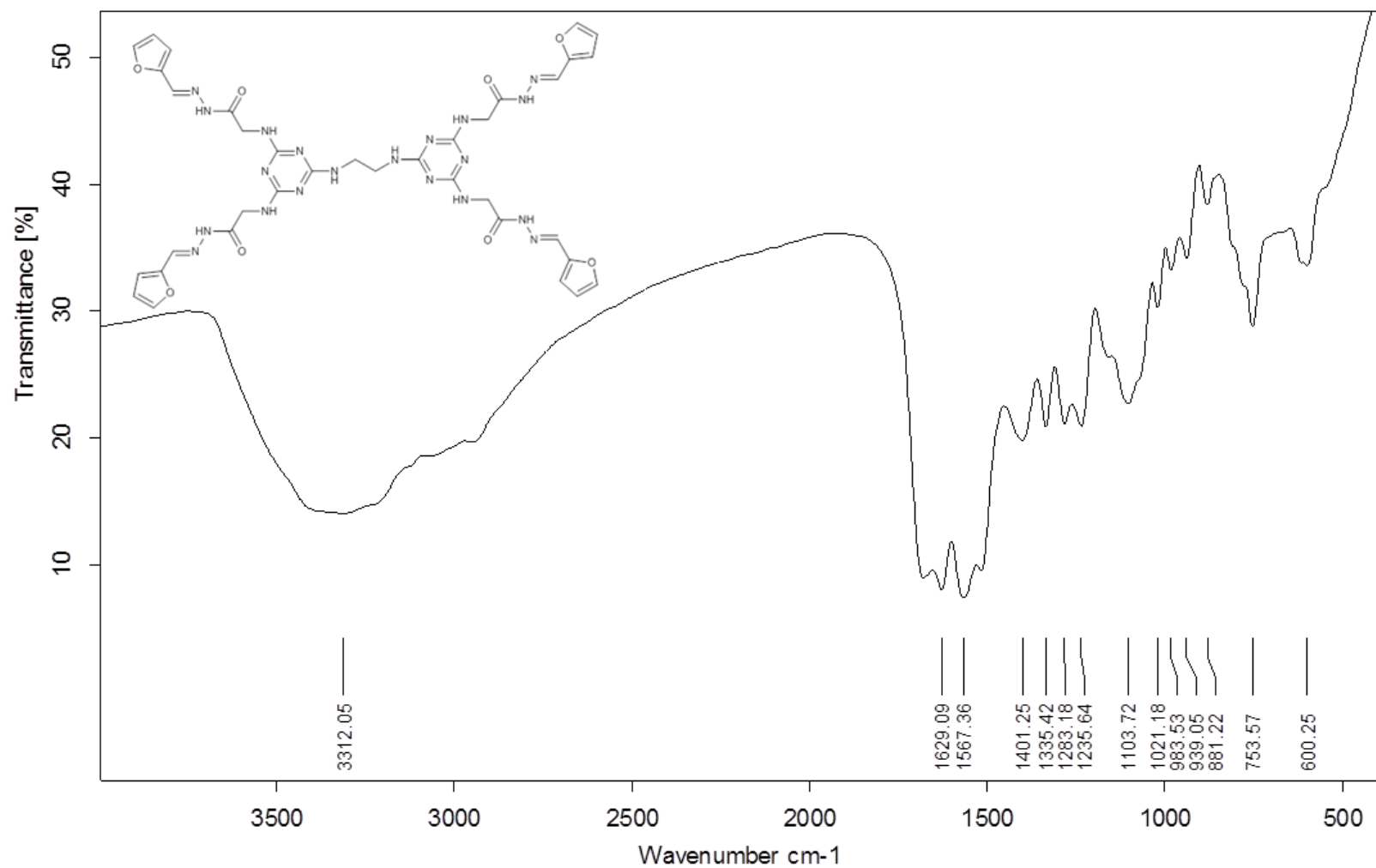


Figure 68: IR (KBr) spectrum of *(N'E,N'''E,N''''E,N''''''E)*-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(furan-2-ylmethylene)acetohydrazide) **19j**.

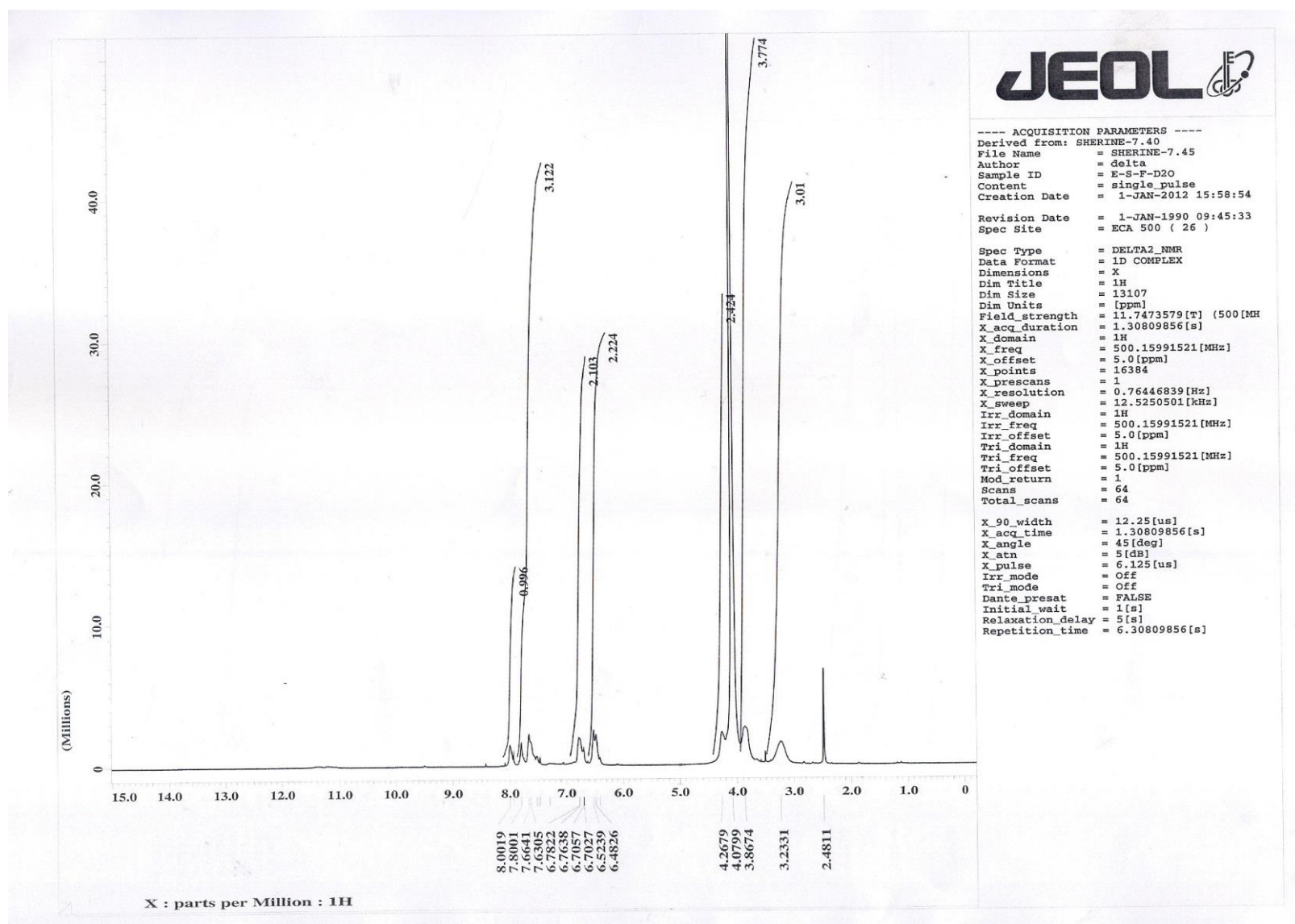


Figure 70: ^1H -NMR ($\text{DMSO}-d_6$) spectrum of $(N'E,N'''E,N''''E,N''''''E)-2,2',2'',2'''-(6,6'-(\text{ethane-1,2-diylbis(azanediyl)})\text{bis}(1,3,5\text{-triazine-6,4,2-triyl}))\text{tetrakis(azanediyl)})\text{tetrakis}(N'-(\text{furan-2-ylmethylene})\text{acetohydrazide})$ **19j**.

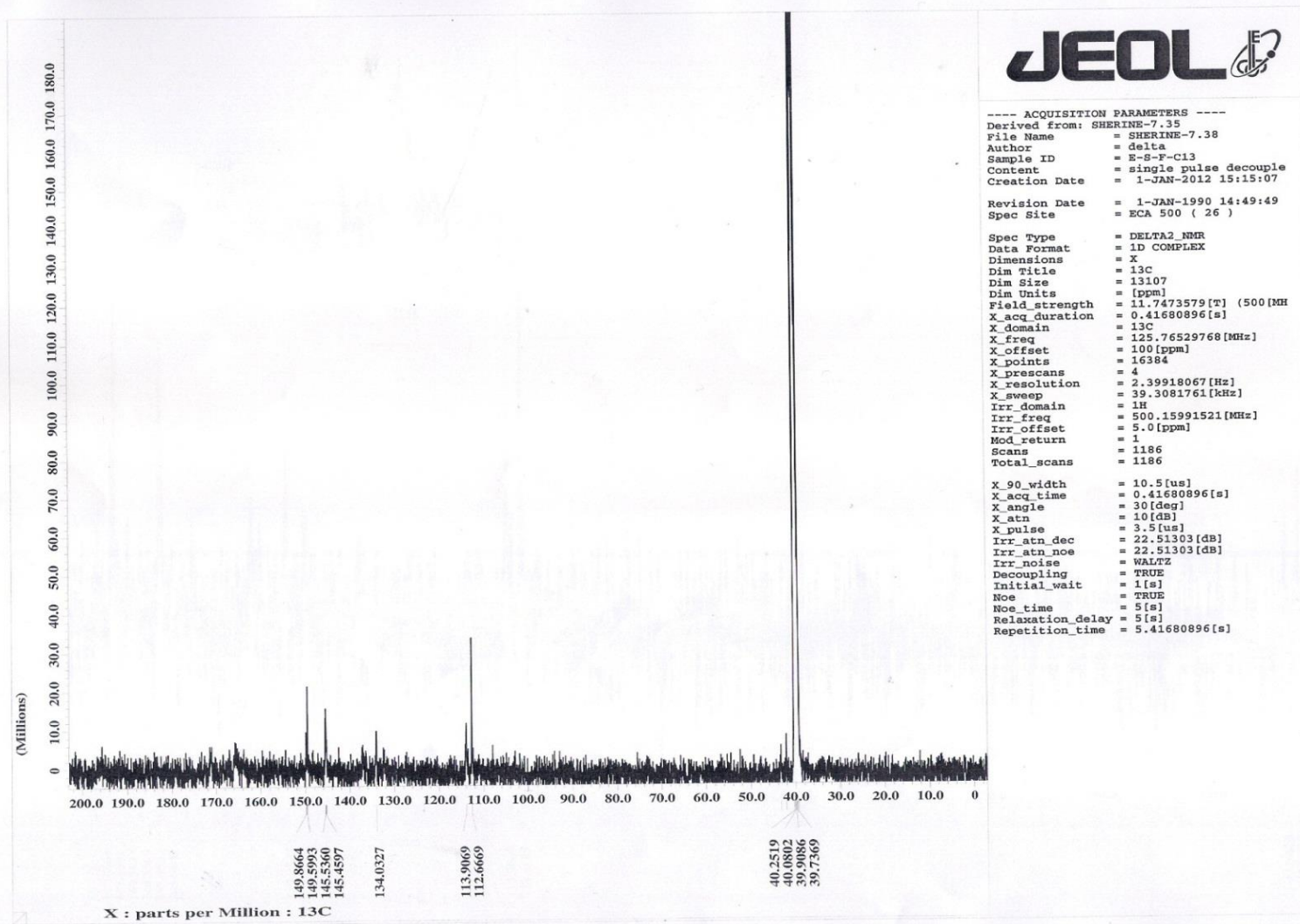


Figure 71: ^{13}C -NMR ($\text{DMSO-}d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(ethane-1,2-diylbis(azanediyl))bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(furan-2-ylmethylene)acetohydrazide) **19j**.

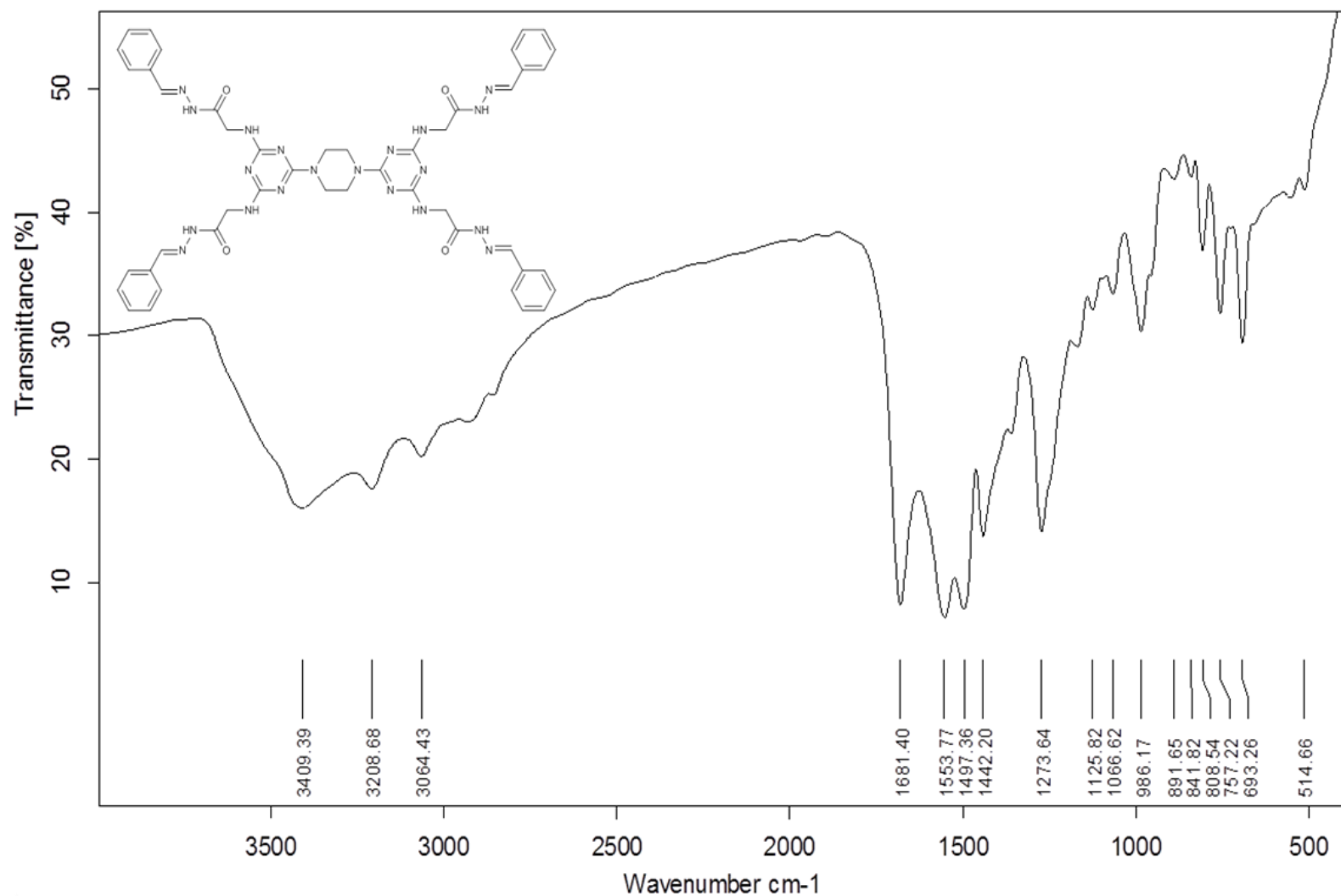


Figure 72: IR (KBr) spectrum of (*N'E,N'''E,N''''E,N'''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-benzylideneacetohydrazide) **20a**.

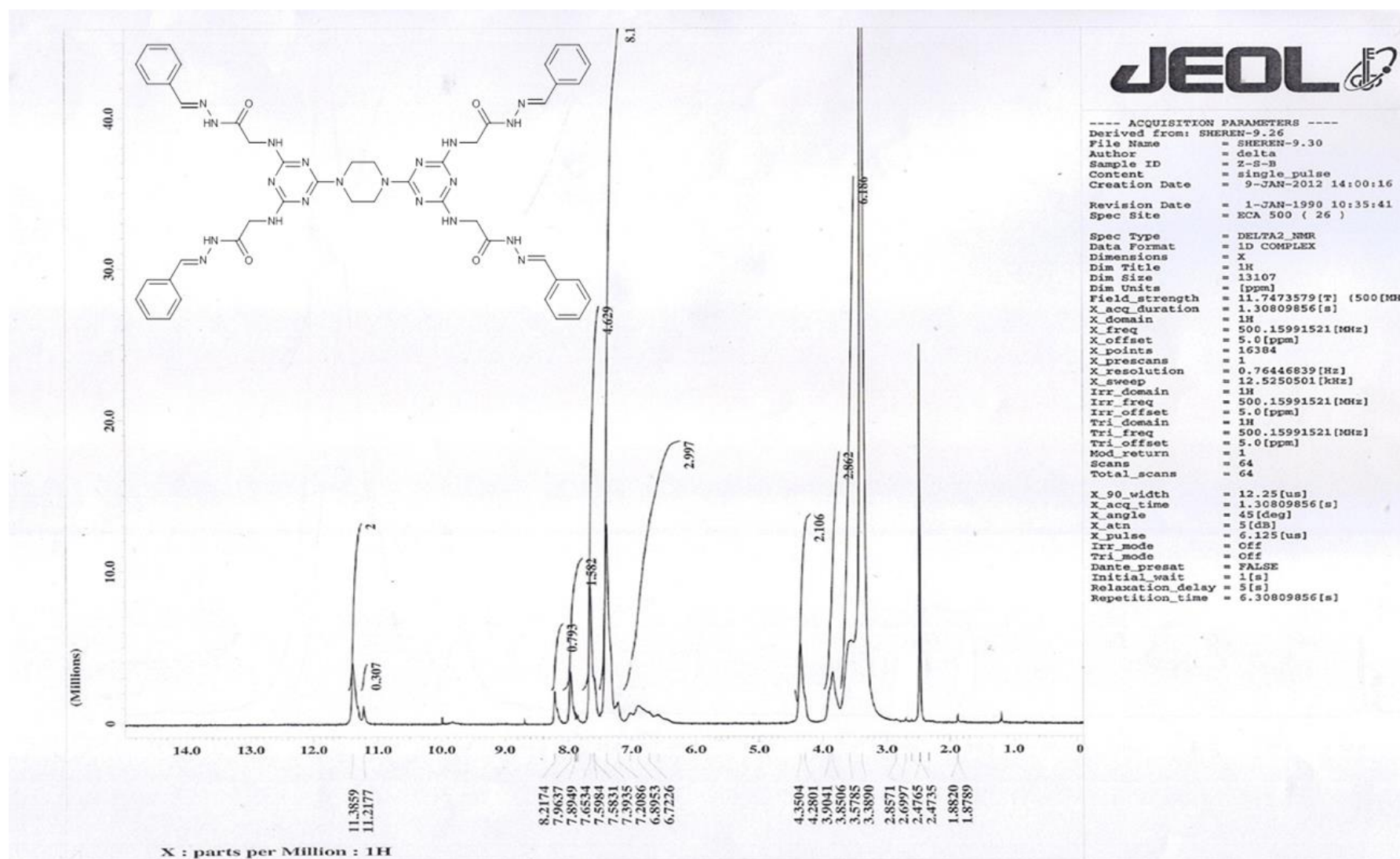


Figure 73: ^1H -NMR ($\text{DMSO-}d_6$) spectrum of (*N'E,N'''E,N''''E,N'''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-benzylideneacetohydrazide) **20a**.

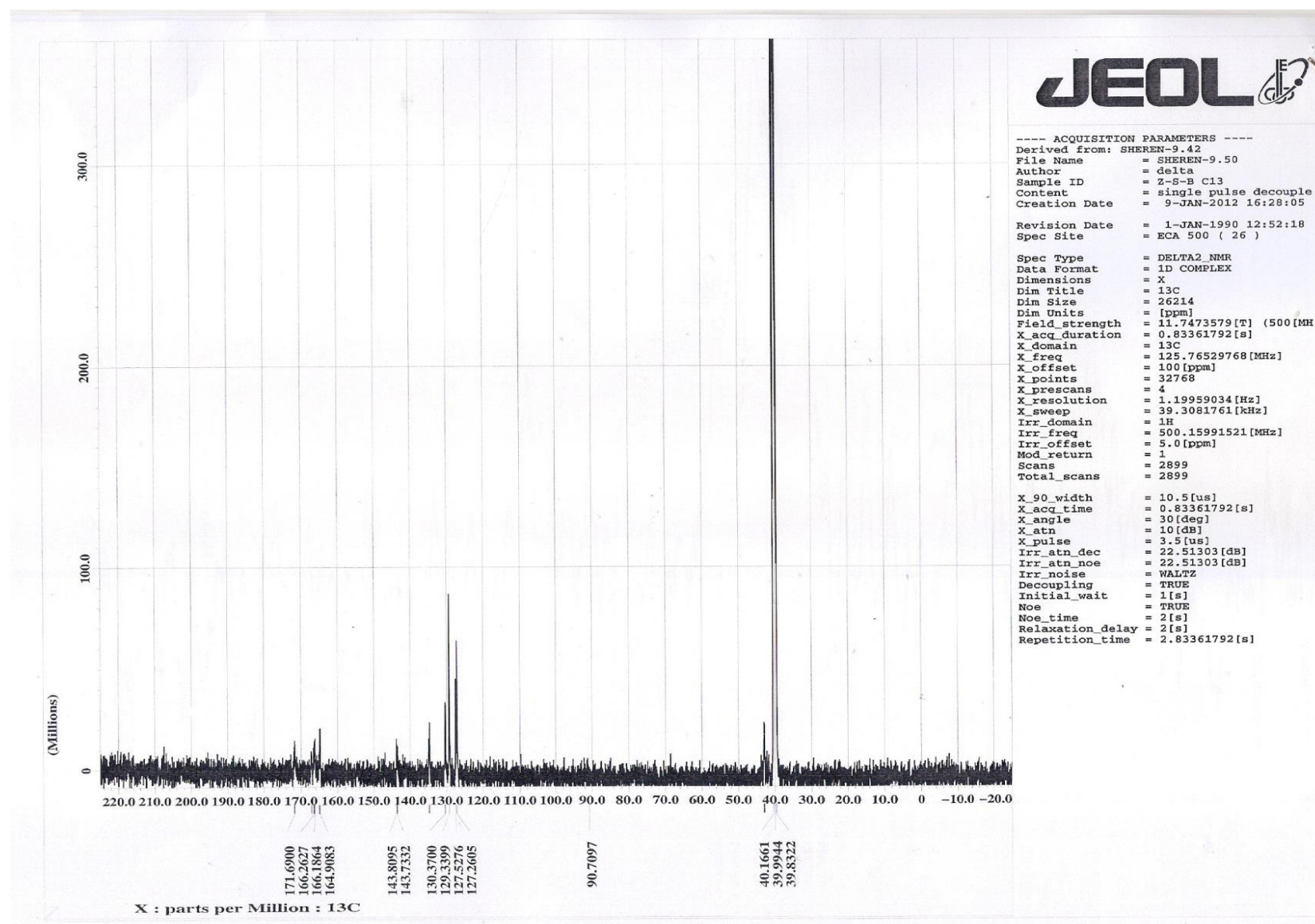


Figure 74: ^{13}C -NMR ($\text{DMSO-}d_6$) spectrum of $(N'E,N'''E,N''''E,N''''''E)$ -2,2',2'',2'''-(((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(N' -benzylideneacetohydrazide) **20a**.

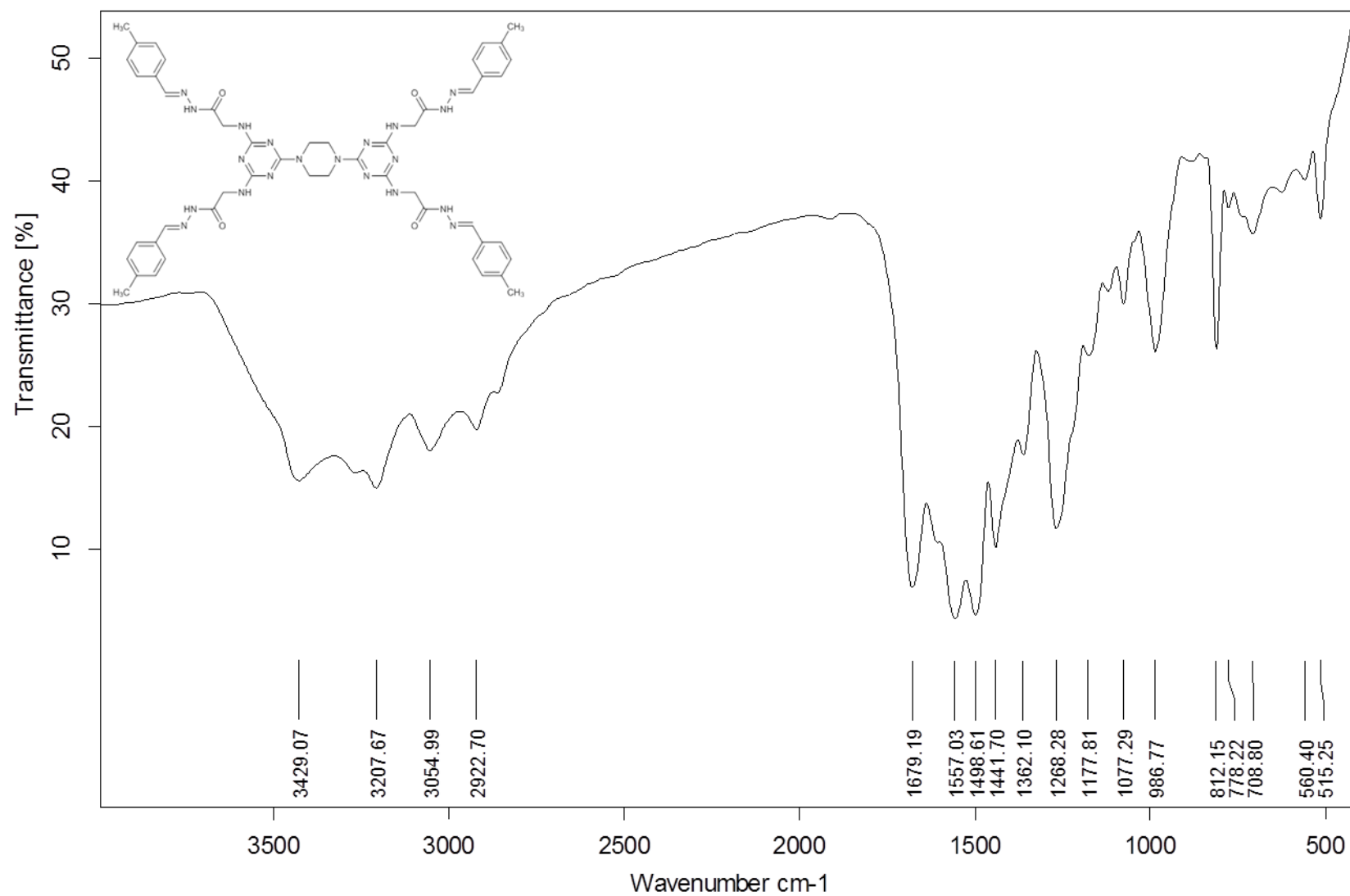


Figure 75: IR (KBr) spectrum of (*N'E,N'''E,N''''E,N'''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-methylbenzylidene)acetohydrazide) **20b**.

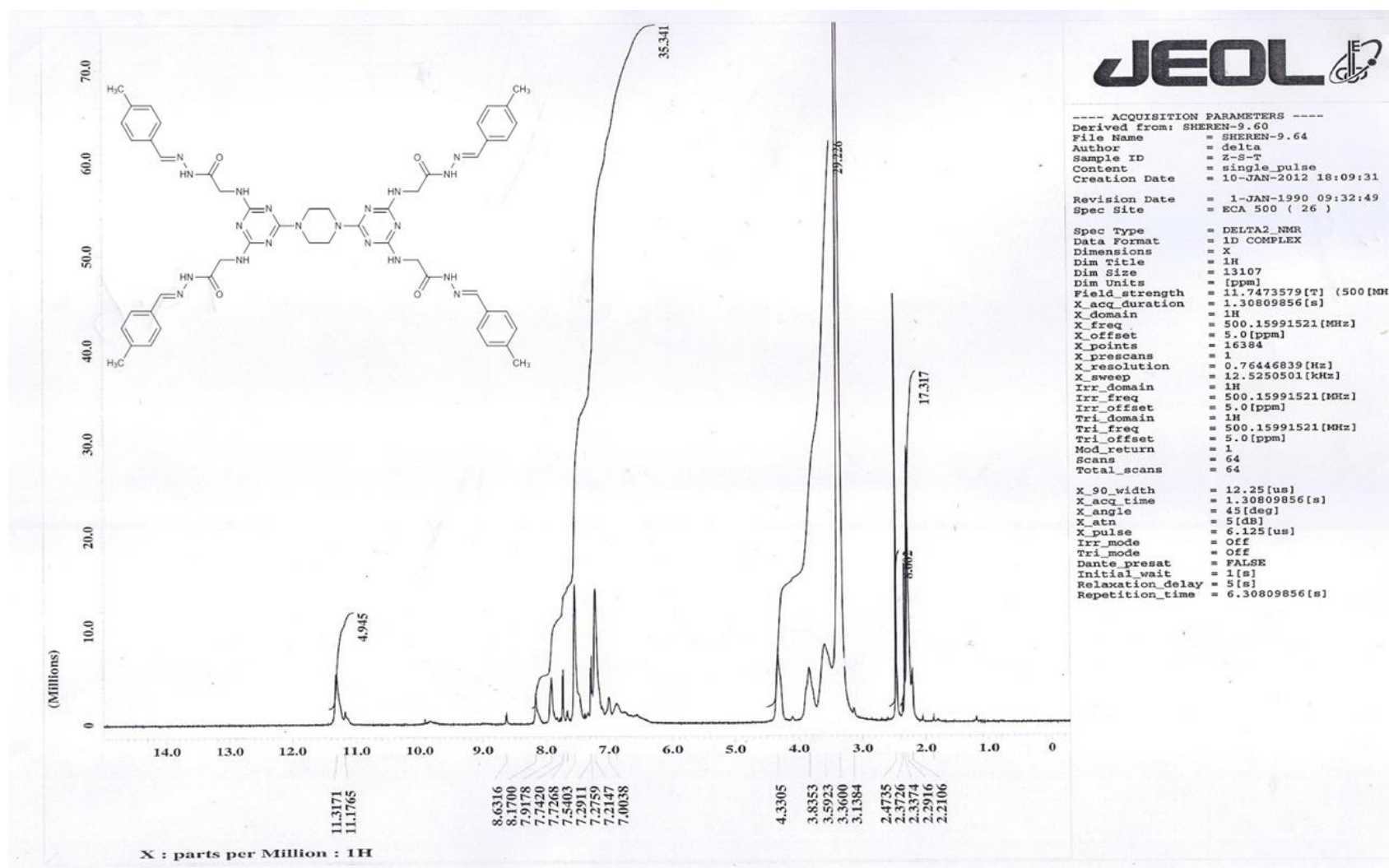


Figure 76: ^1H -NMR ($\text{DMSO-}d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-methylbenzylidene)acetohydrazide) **20b**.

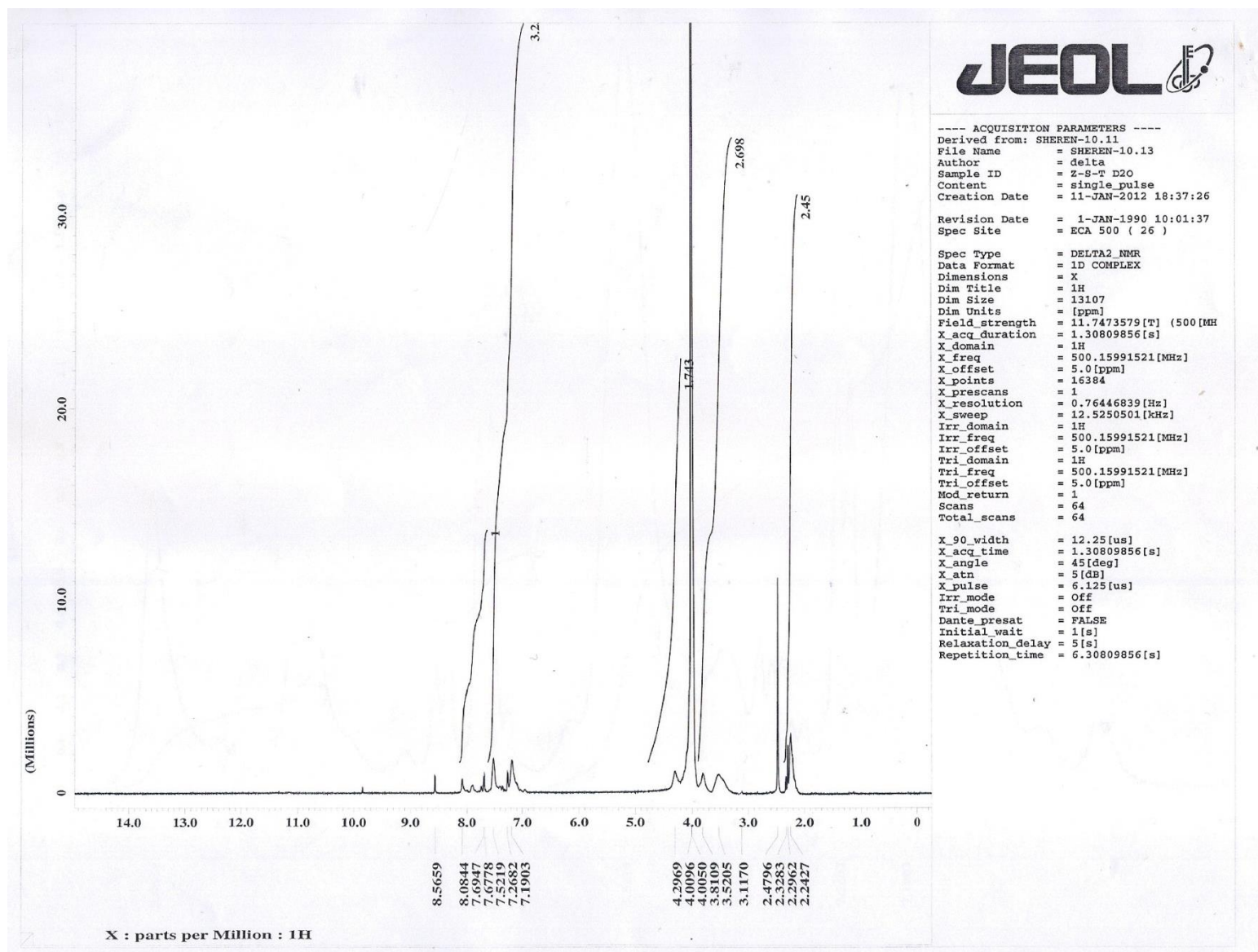


Figure 77: ^1H -NMR ($\text{DMSO}-d_6/\text{D}_2\text{O}$) spectrum of $(N'E,N''E,N''''E,N''''''E)-2,2',2'',2'''-((6,6'-(\text{piperazine-1,4-diyl})\text{bis}(1,3,5\text{-triazine-6,4,2-triyl}))\text{tetrakis}(\text{azanediyl}))\text{tetrakis}(N'-(4\text{-methylbenzylidene})\text{acetohydrazide})$ **20b**.

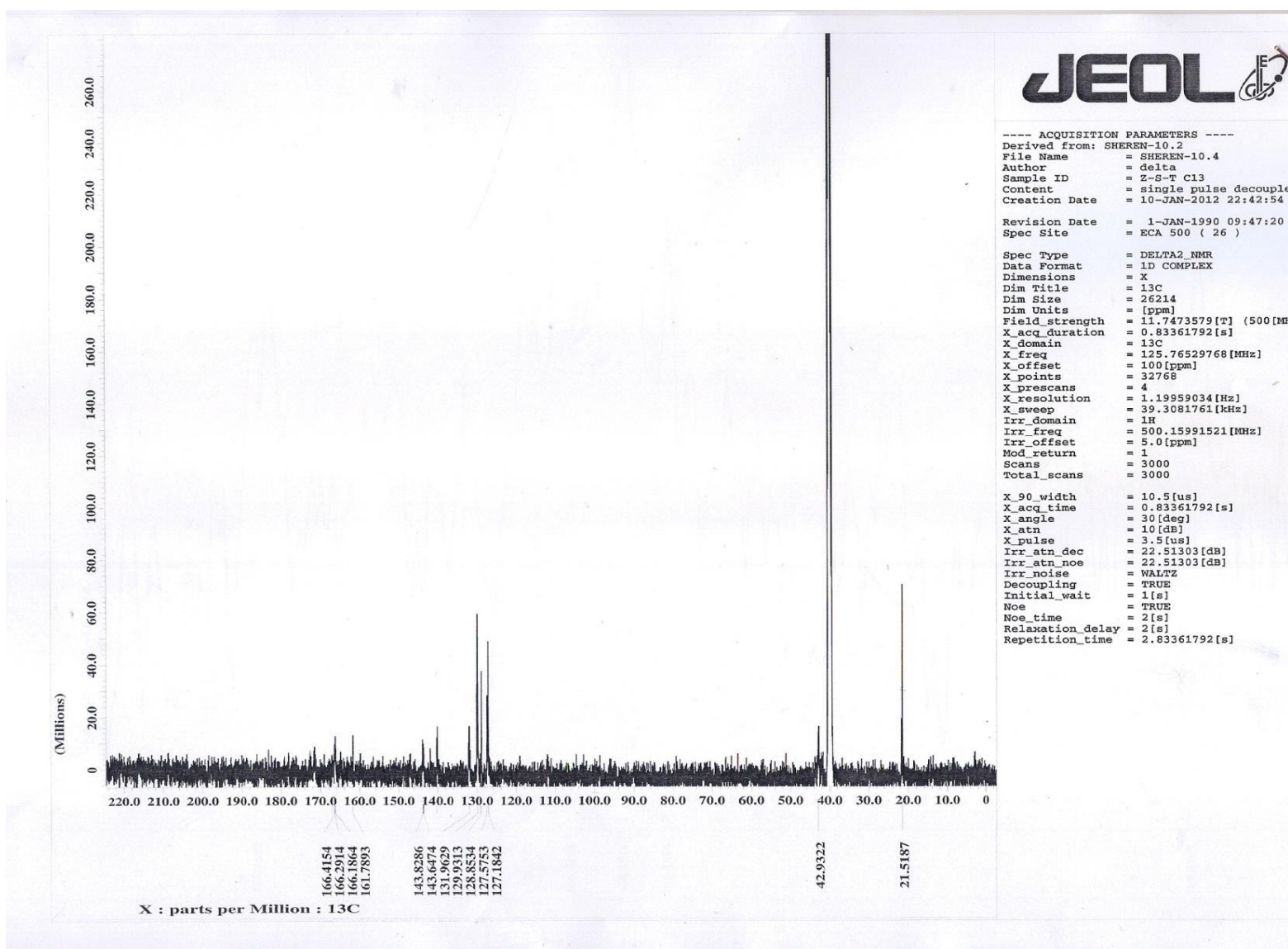


Figure 78: ^{13}C -NMR (DMSO- d_6) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-methylbenzylidene)acetohydrazide) **20b**.

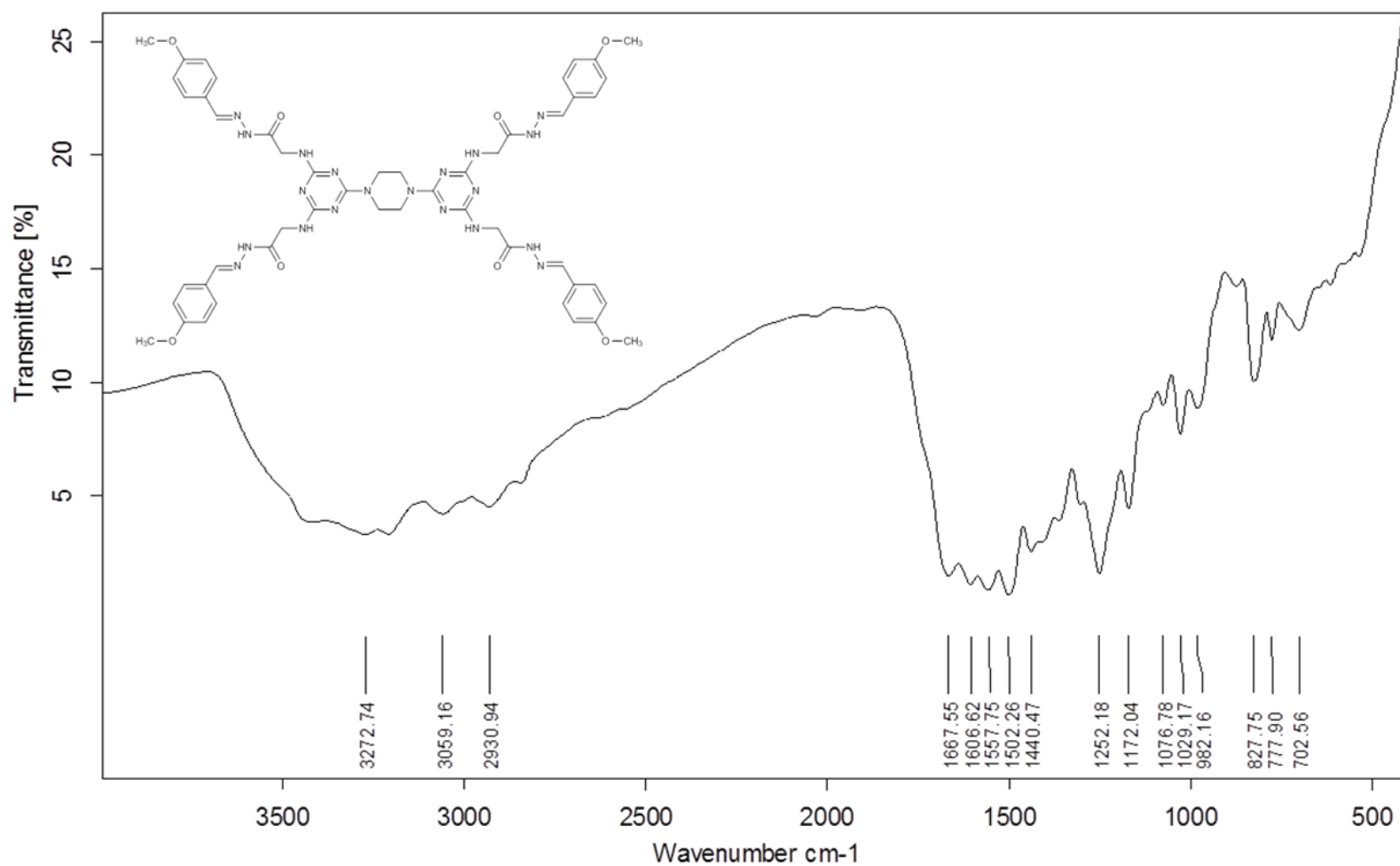


Figure 79: IR (KBr) spectrum of (*N'E,N'''E,N''''E,N'''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-methoxybenzylidene)acetohydrazide) **20c**.

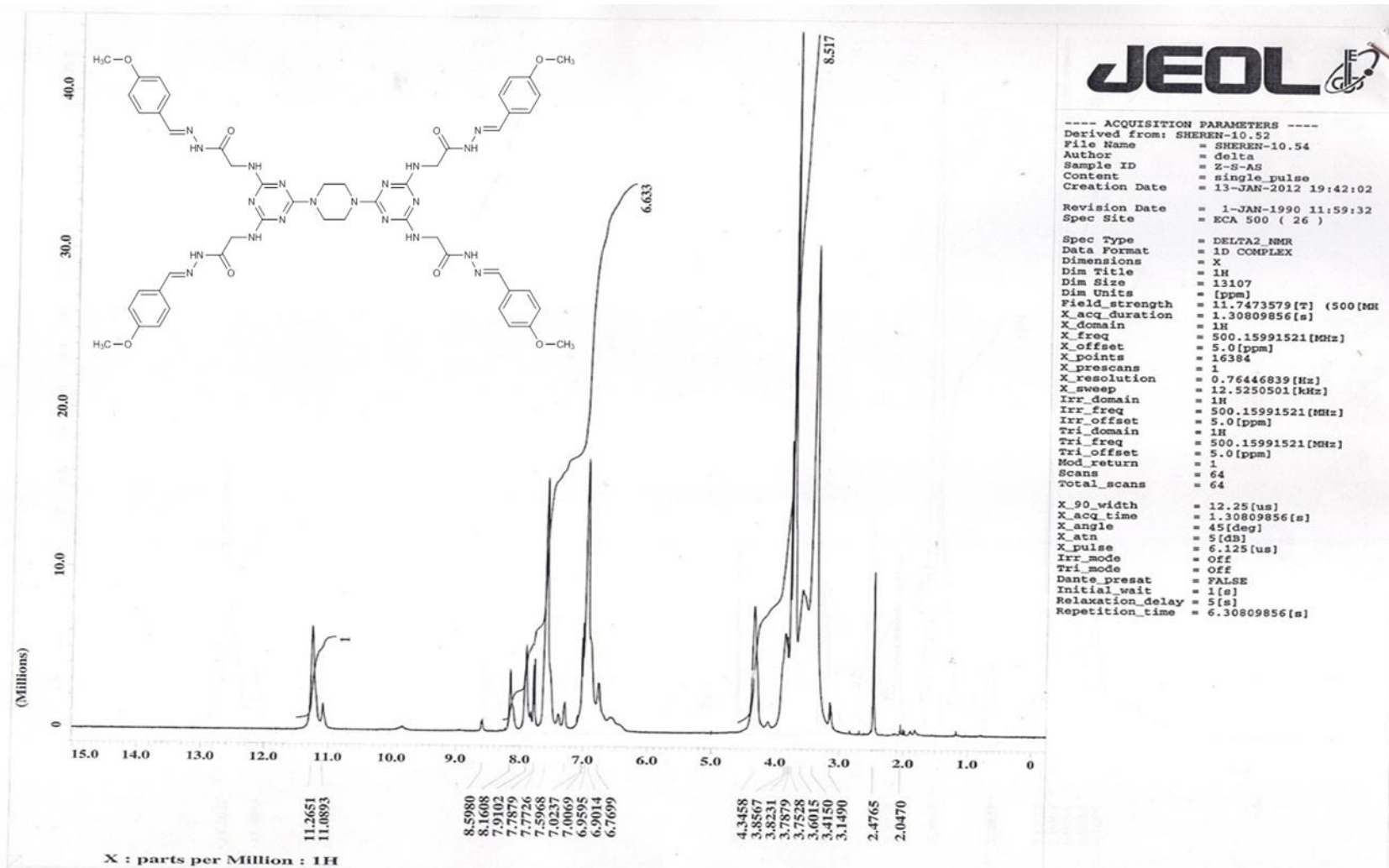


Figure 80: ¹H-NMR (DMSO-*d*₆) spectrum of (*N'E,N'''E,N''''E,N'''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-methoxybenzylidene)acetohydrazide) **20c**.

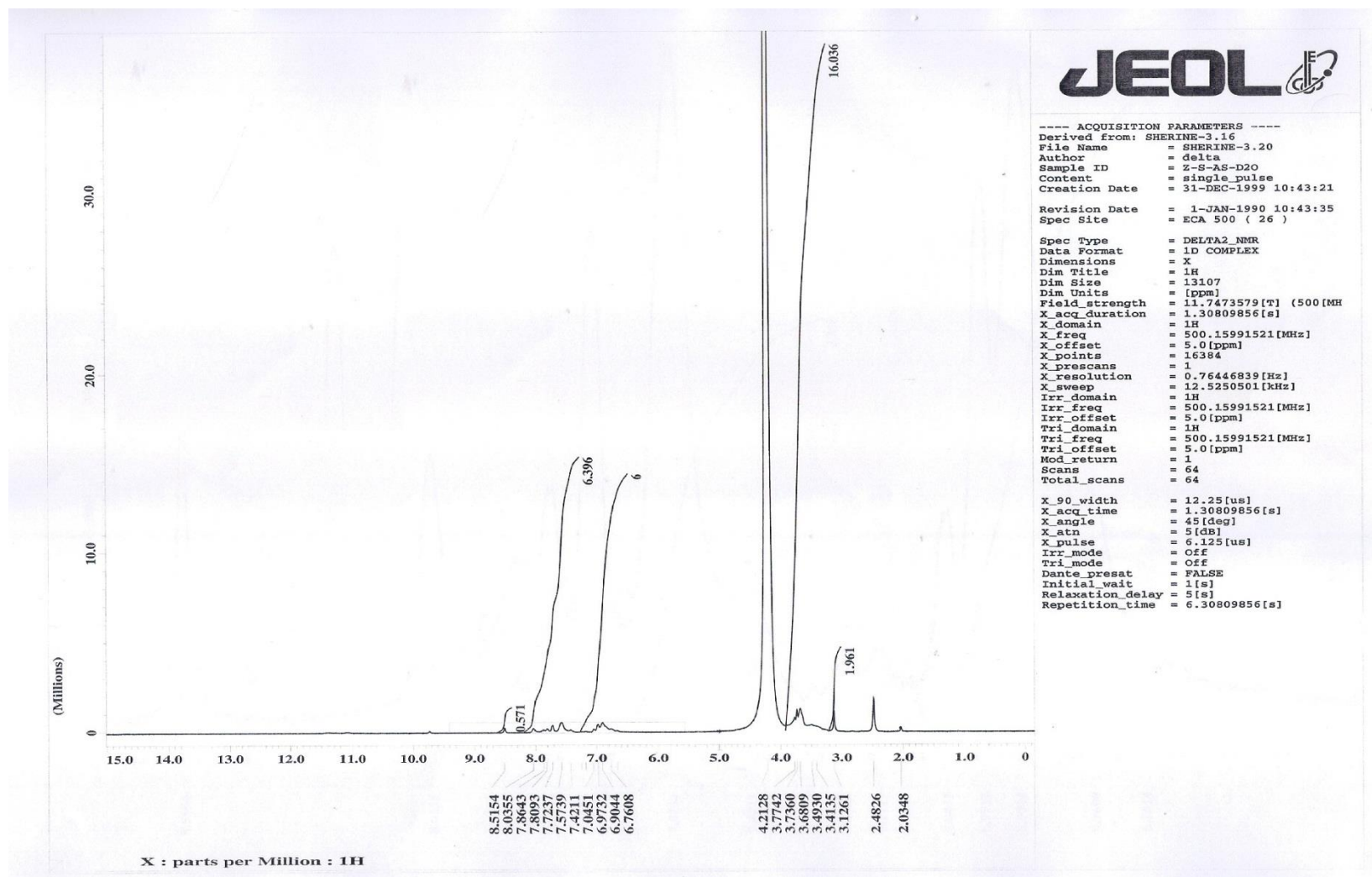


Figure 81: ^1H -NMR ($\text{DMSO}-d_6$) spectrum of (*N'E,N'''E,N''''E,N'''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediy))tetrakis(*N'*-(4-methoxybenzylidene)acetohydrazide) **20c**.

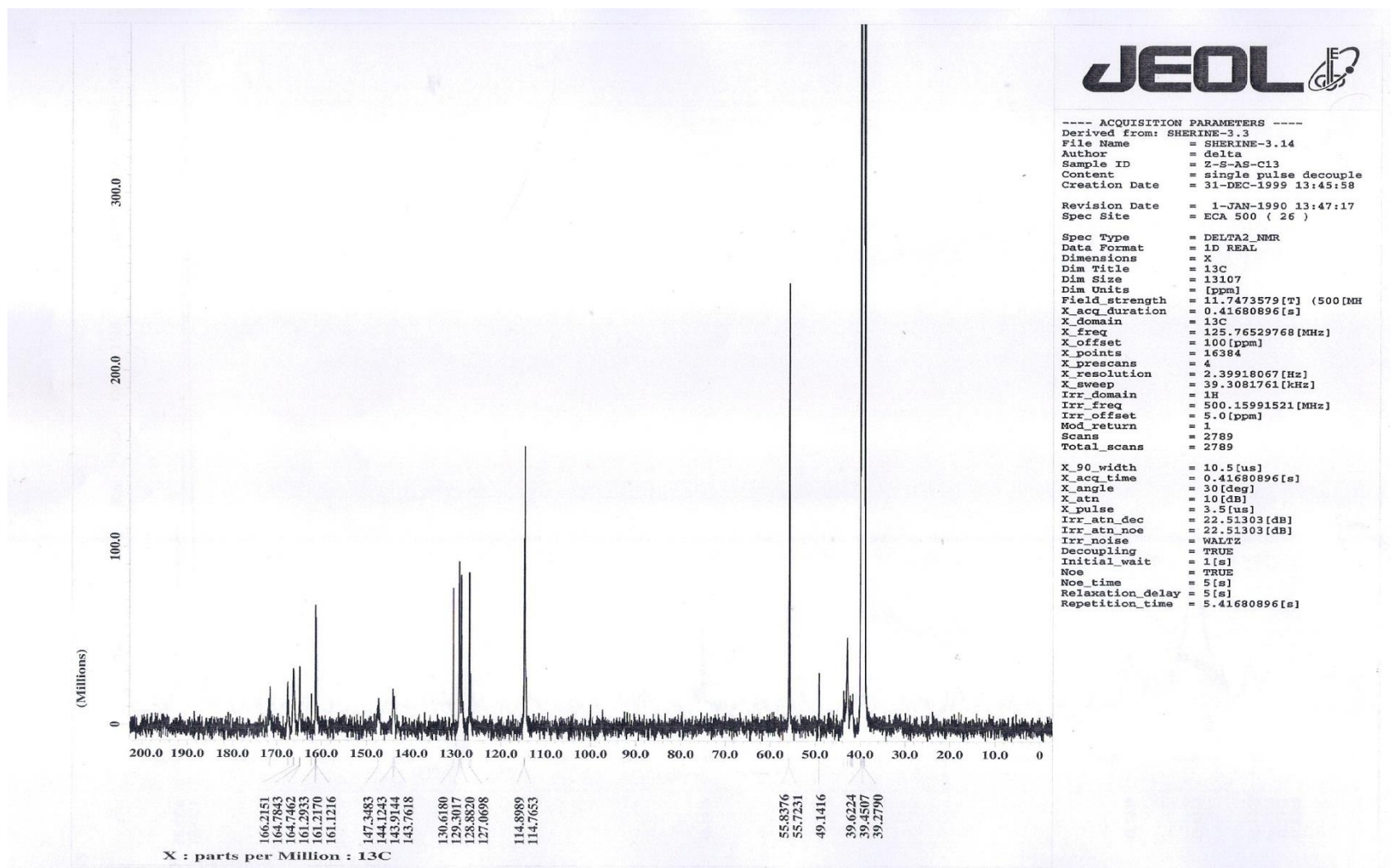


Figure 82: ^{13}C -NMR ($\text{DMSO-}d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-methoxybenzylidene)acetohydrazide) **20c**.

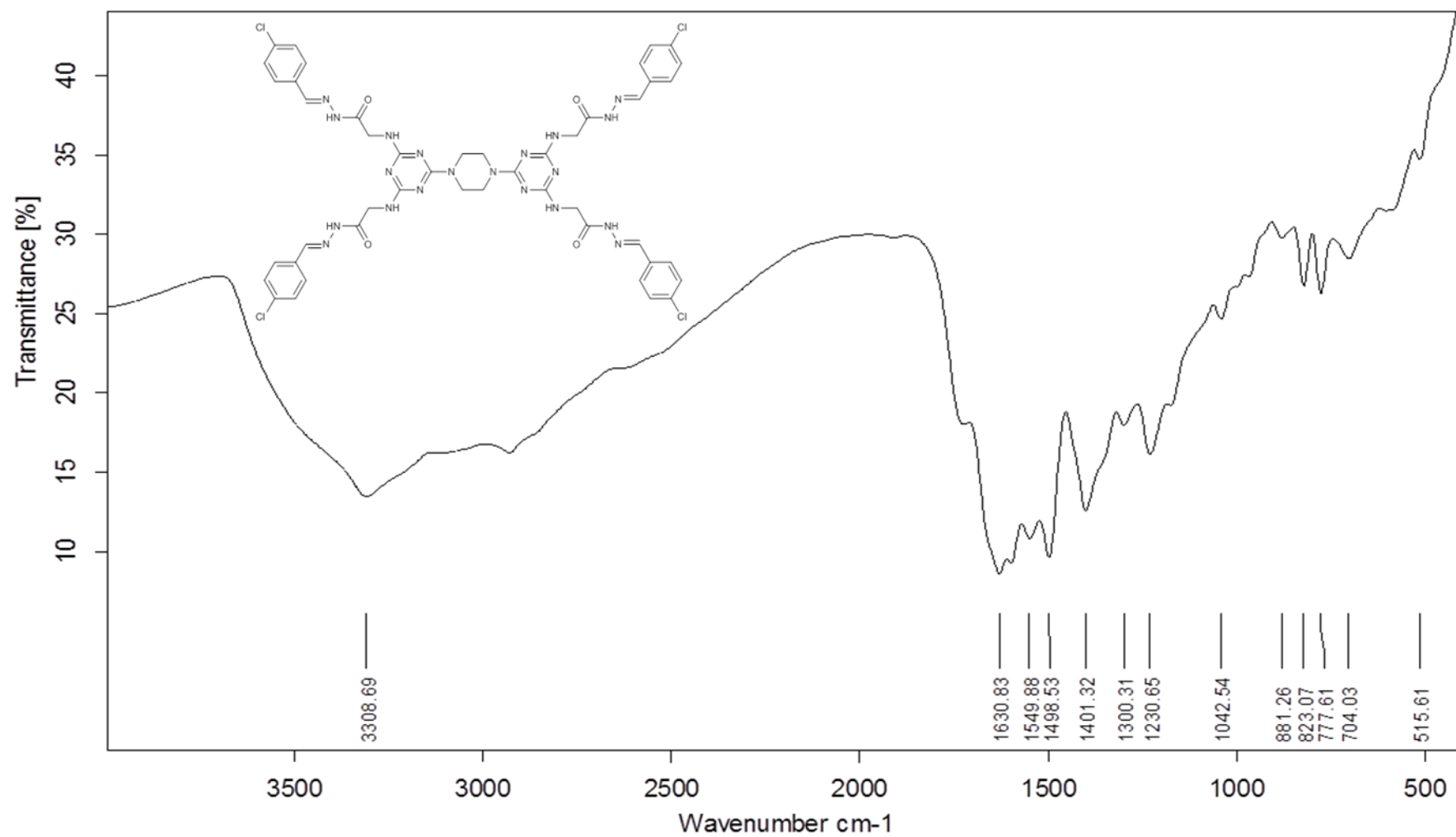


Figure 83: IR (KBr) spectrum of (*N'E,N'''E,N''''E,N'''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-chlorobenzylidene)acetohydrazide) **20d**.

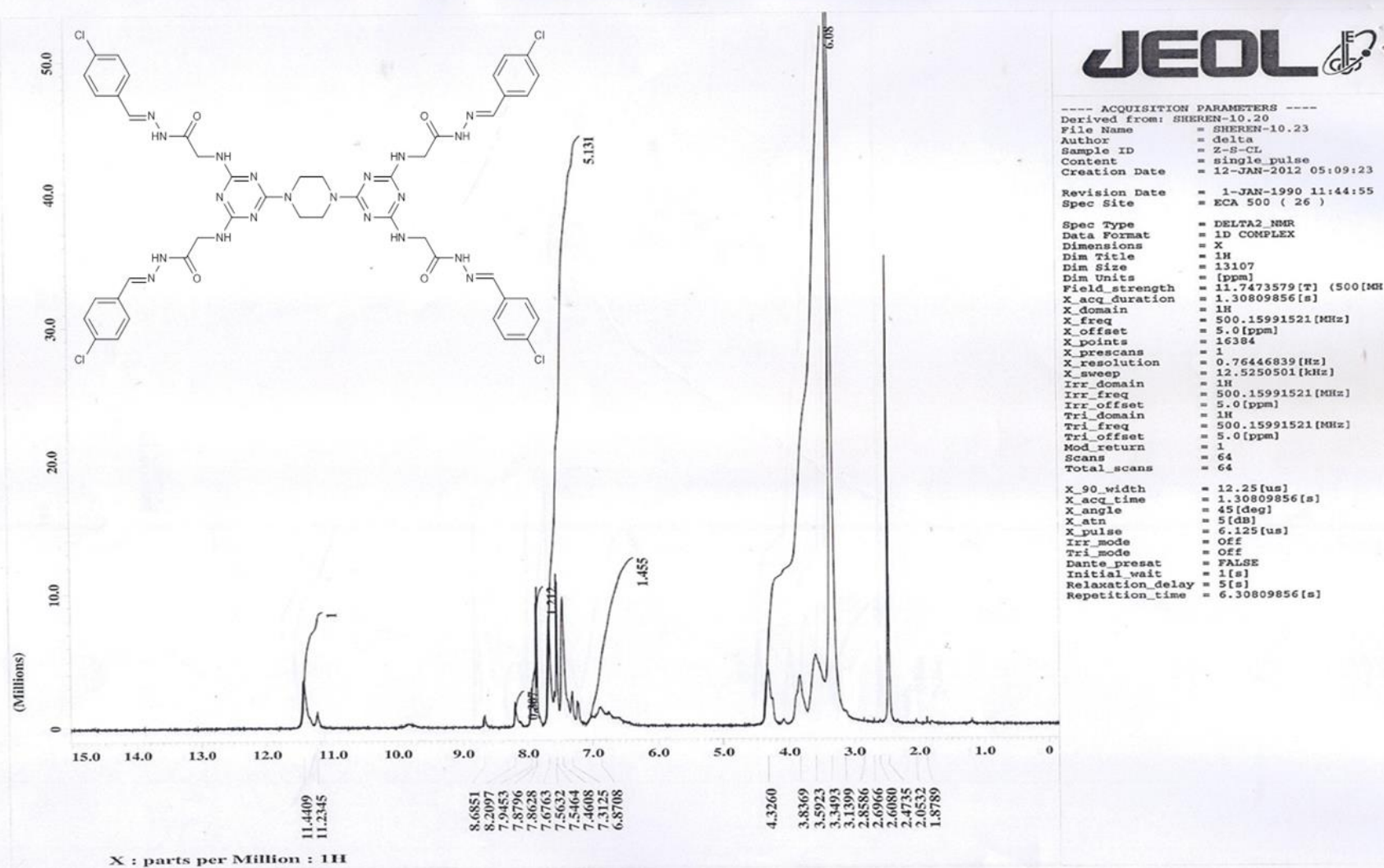


Figure 84: ^1H -NMR ($\text{DMSO-}d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-chlorobenzylidene)acetohydrazide) **20d**.

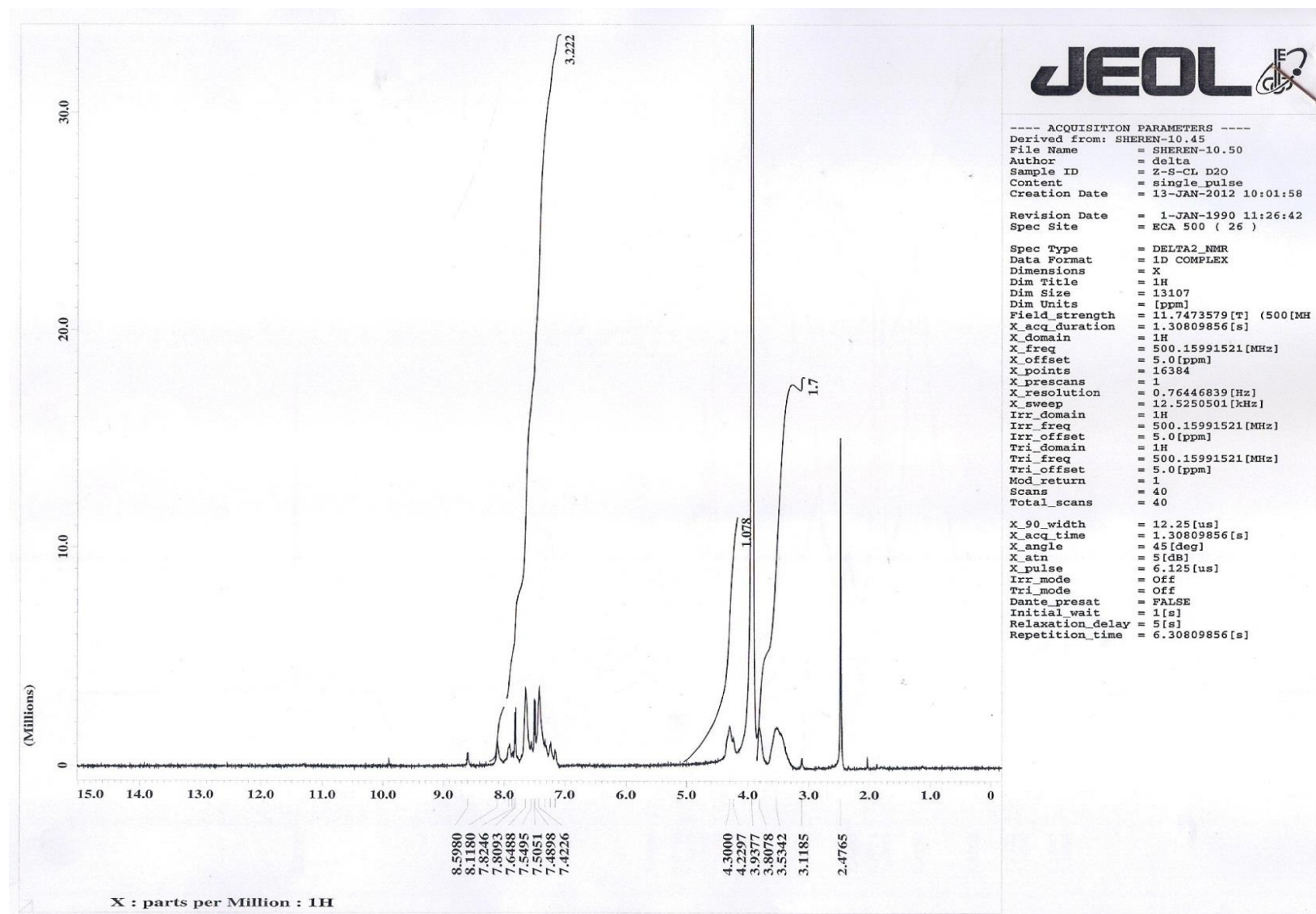


Figure 85: ^1H -NMR ($\text{DMSO}-d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-(((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-chlorobenzylidene)acetohydrazide) **20d**.

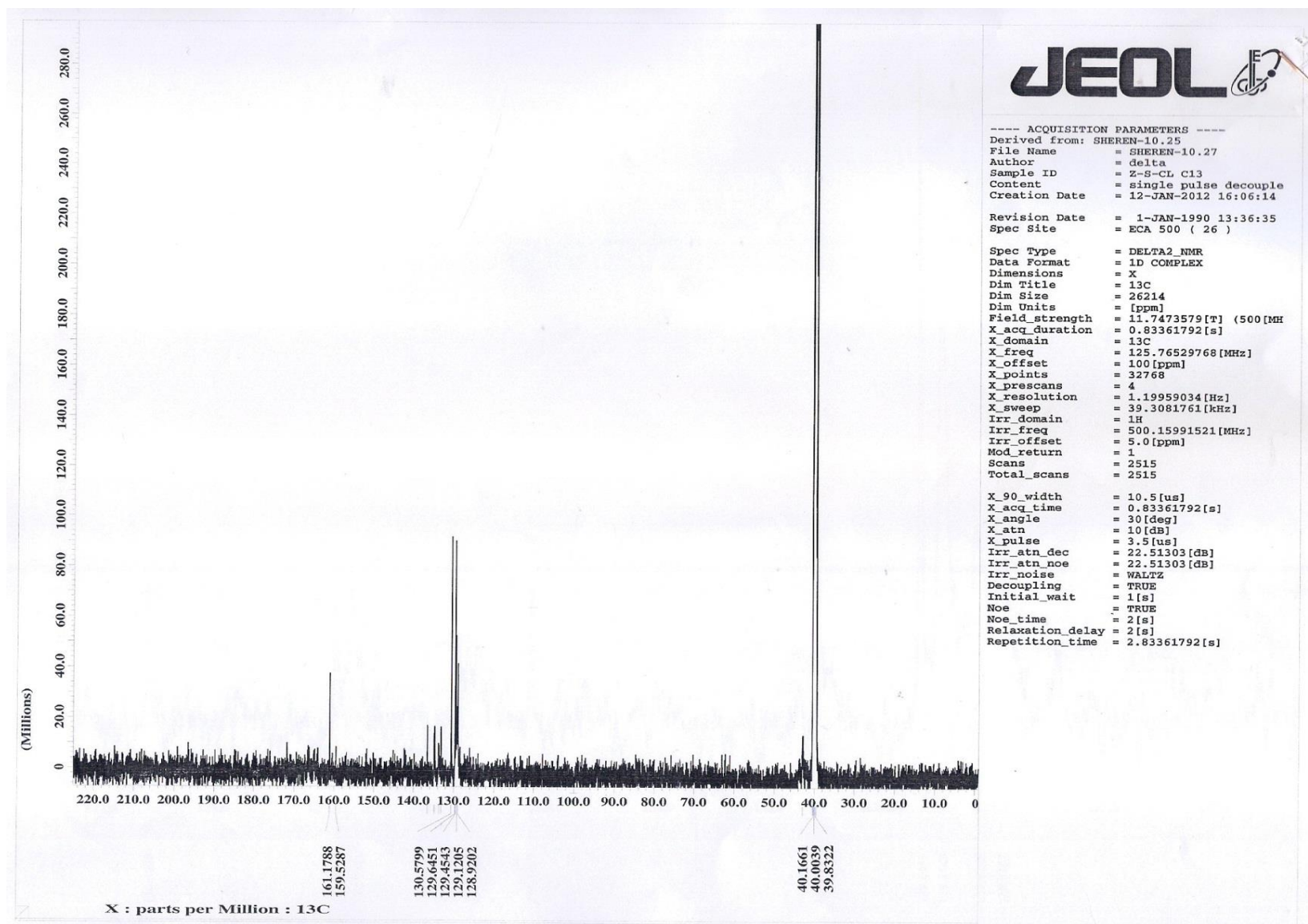


Figure 86: ^{13}C -NMR ($\text{DMSO}-d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-chlorobenzylidene)acetohydrazide) **20d**.

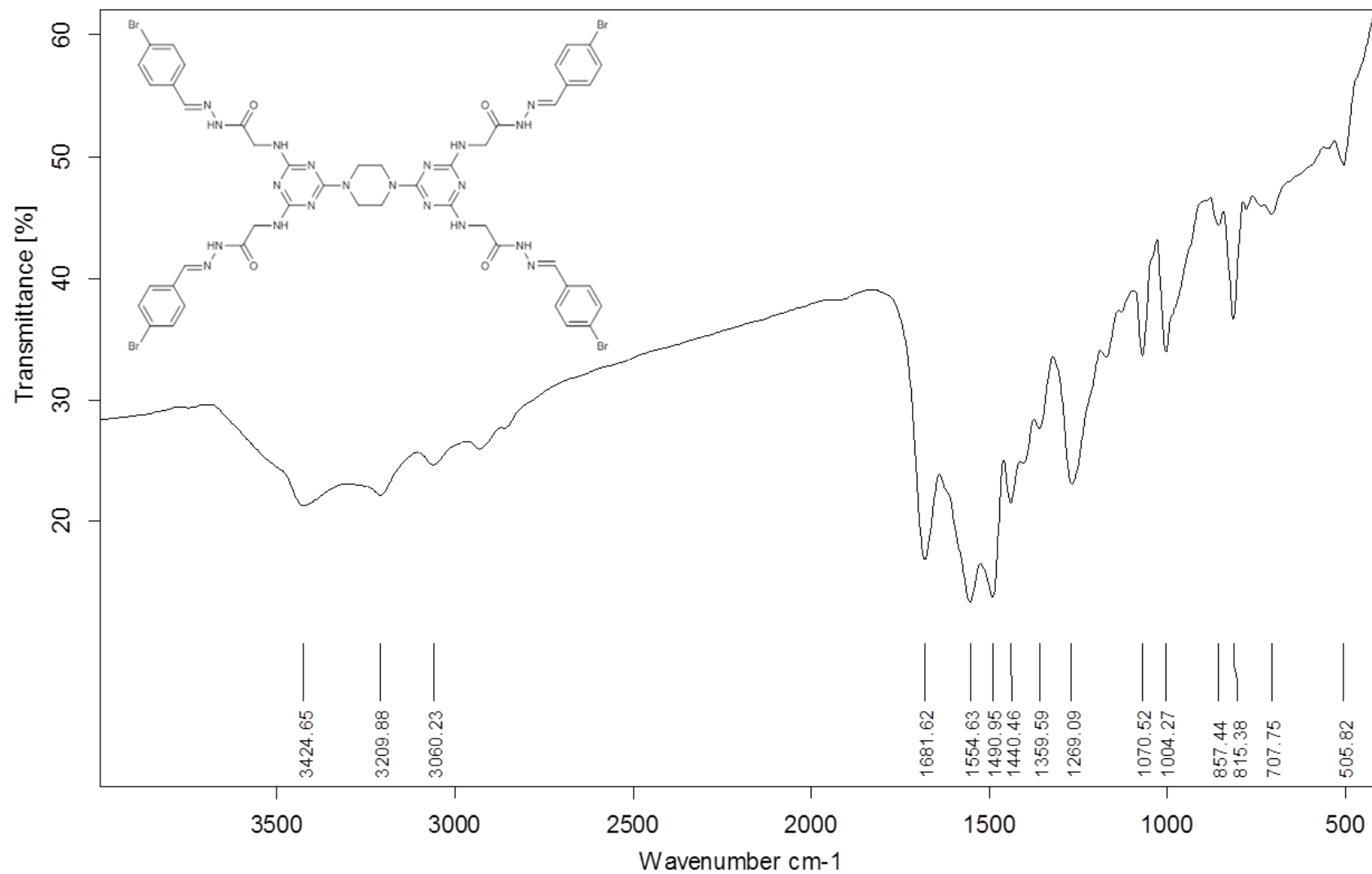


Figure 87: IR (KBr) spectrum of (*N'E,N'''E,N''''E,N'''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-bromobenzylidene)acetohydrazide) **20e**.

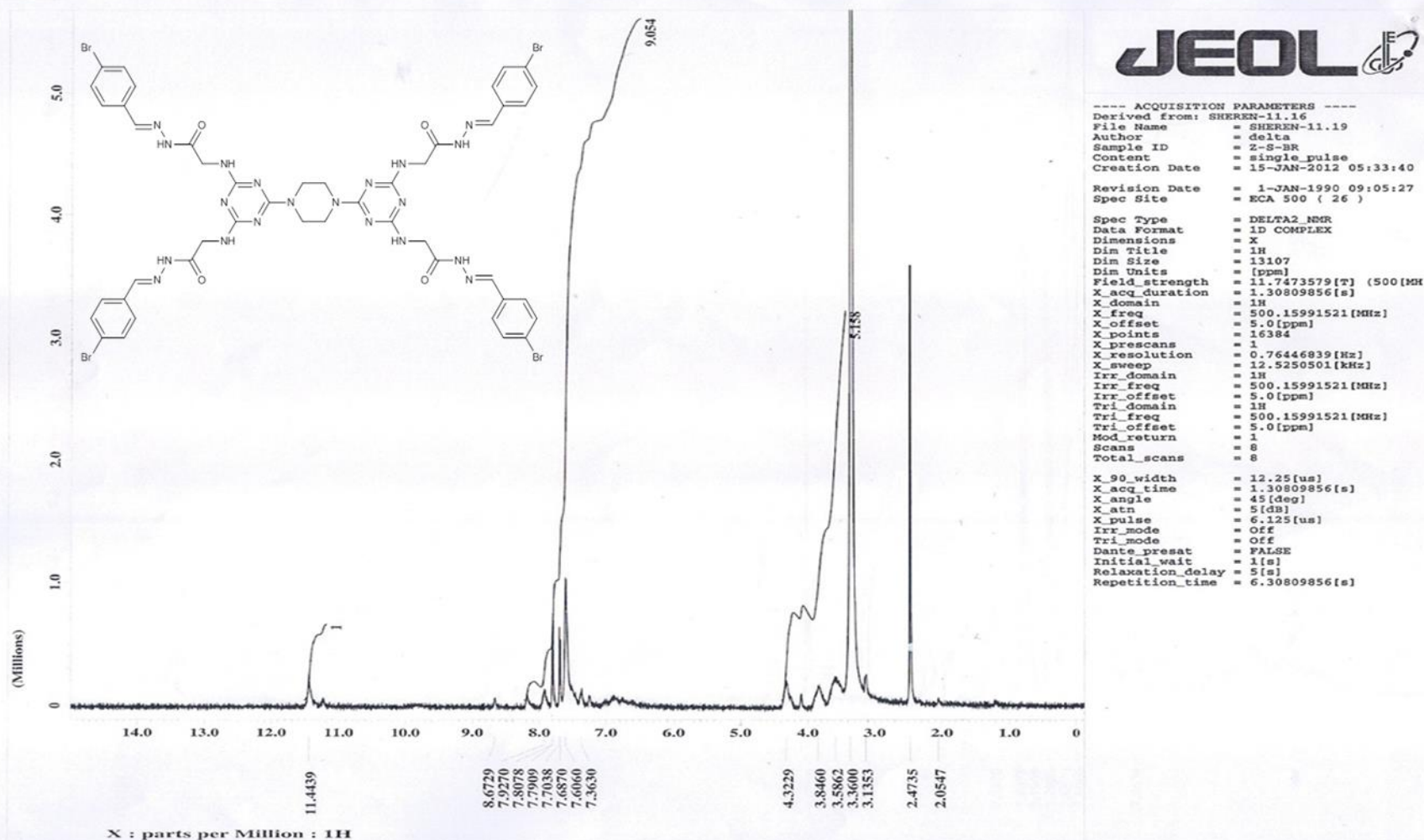


Figure 88: ¹H-NMR (DMSO-*d*₆) spectrum of (*N'E,N''''E,N''''''E,N''''''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-bromobenzylidene)acetohydrazide) **20e**.

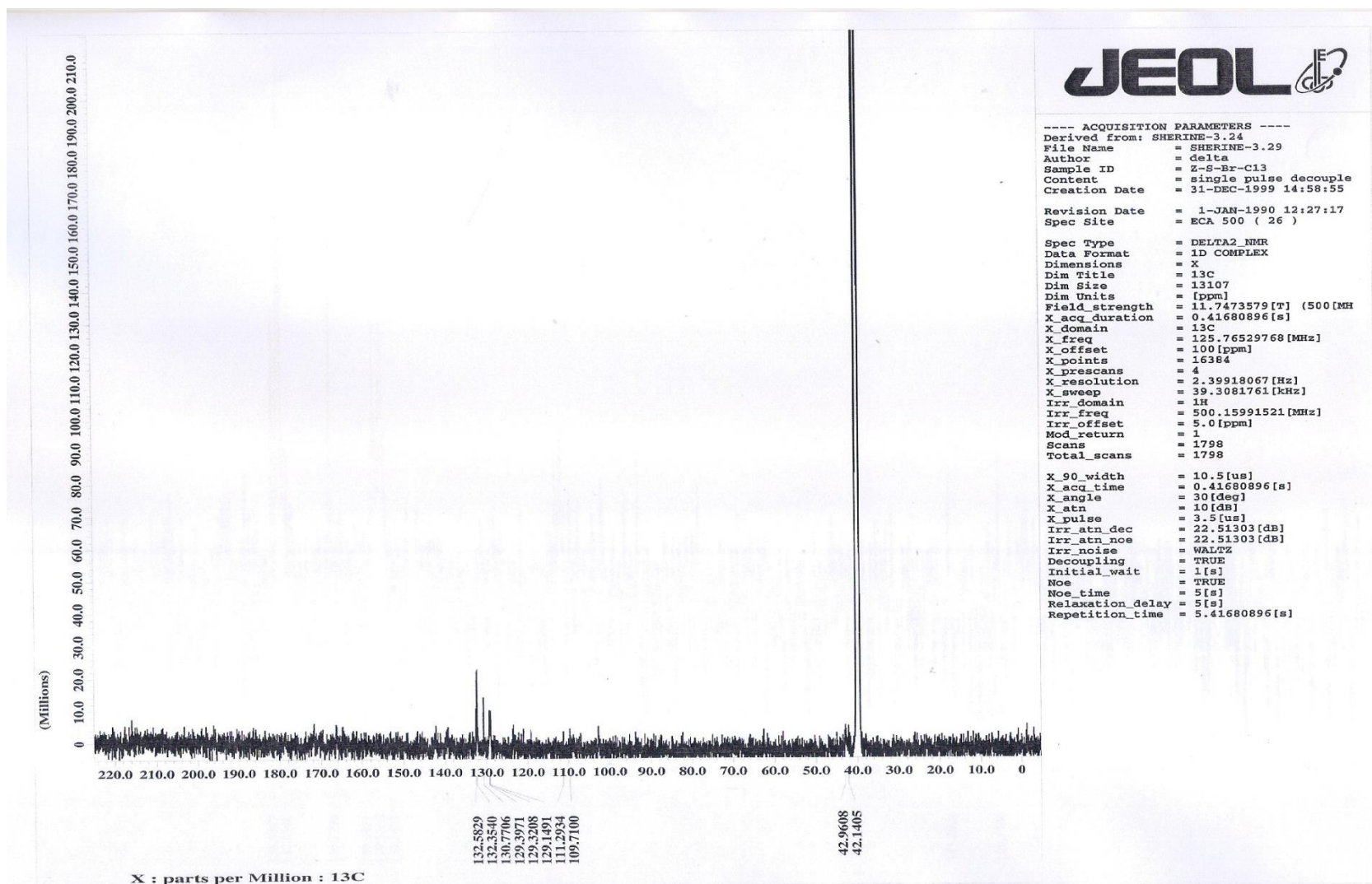


Figure 89: ^{13}C -NMR ($\text{DMSO}-d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-bromobenzylidene)acetohydrazide) **20e**.

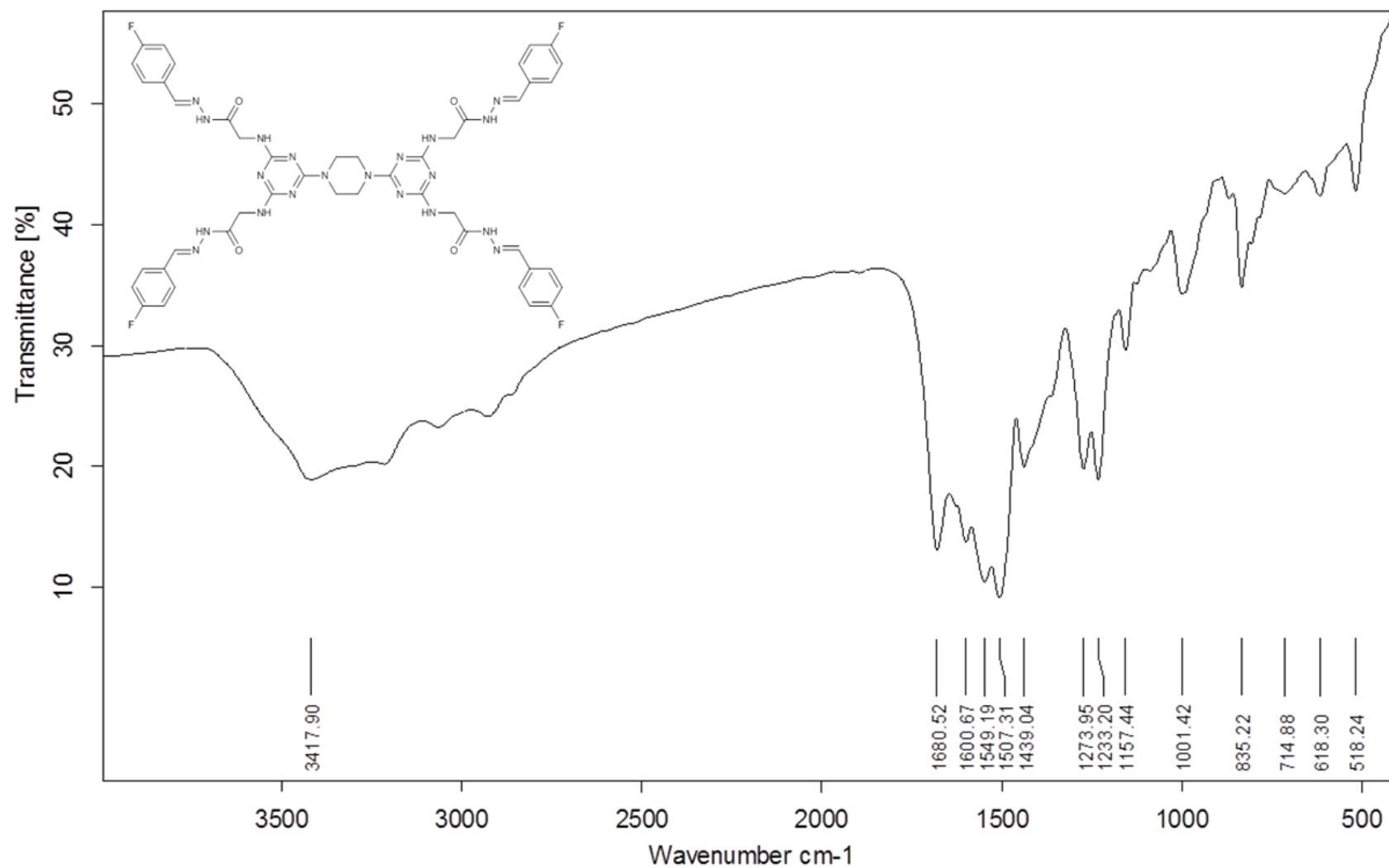


Figure 90: IR (KBr) spectrum of *(N'E,N'''E,N''''E,N''''''E)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(N'-(4-fluorobenzylidene)acetohydrazide)* **20f**.

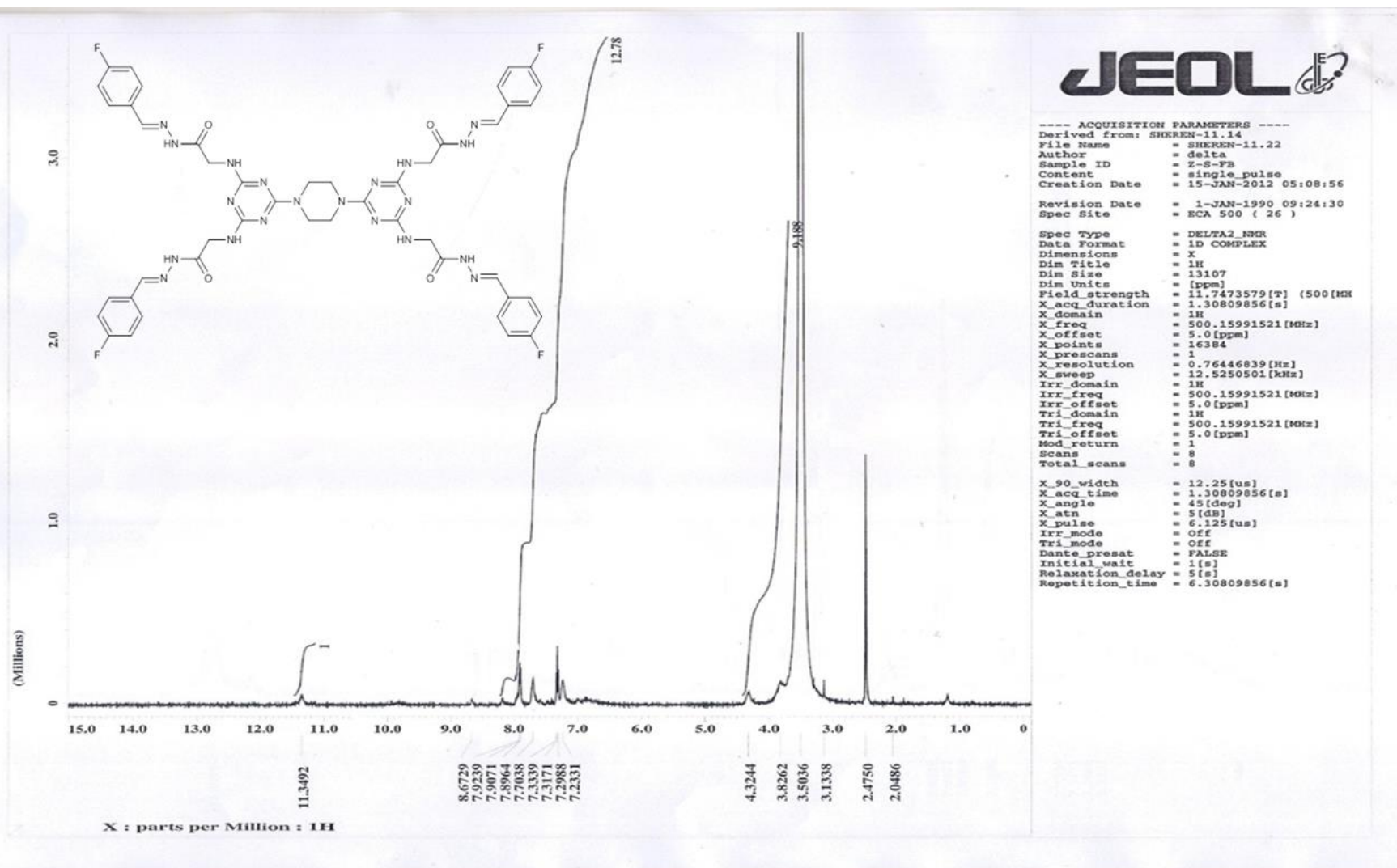


Figure 91: ¹H-NMR (DMSO-*d*₆) spectrum of (*N'E,N''''E,N''''''E,N''''''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-fluorobenzylidene)acetohydrazide) **20f**.

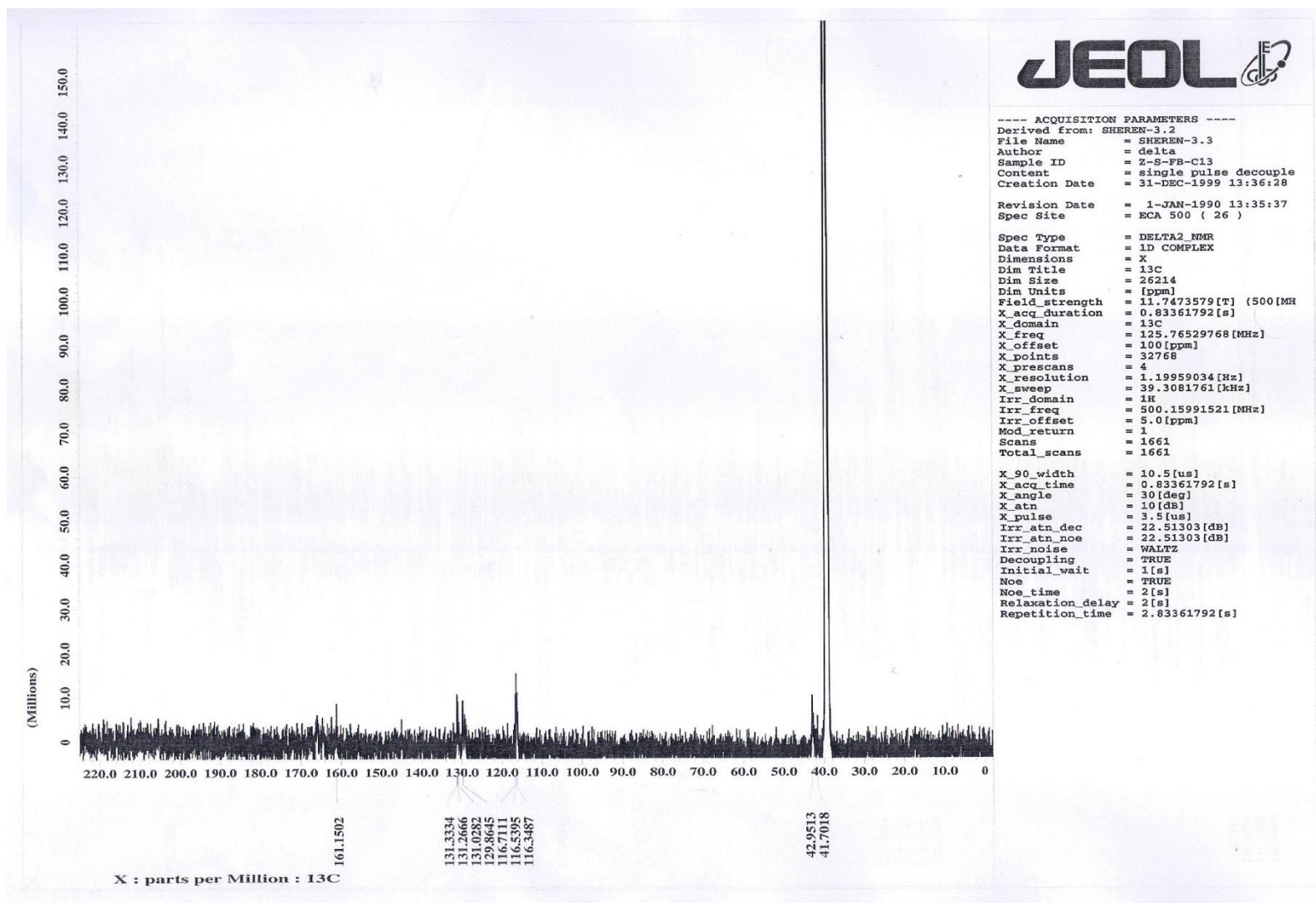


Figure 92: ^{13}C -NMR (DMSO- d_6) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-(((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-fluorobenzylidene)acetohydrazide) **20f**.

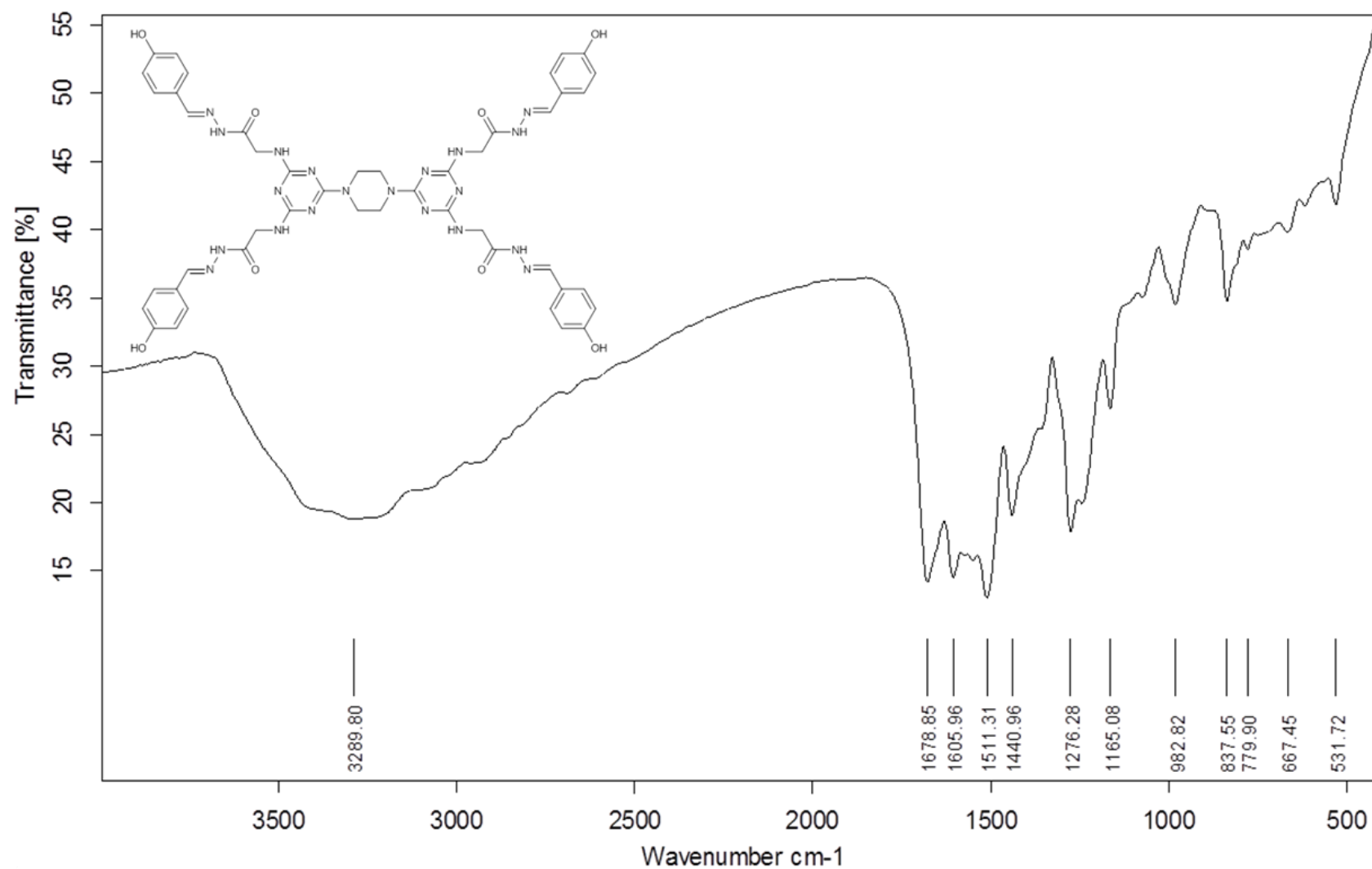


Figure 93: IR (KBr) spectrum of (*N'E,N'''E,N''''E,N'''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-hydroxybenzylidene)acetohydrazide) **20g**.

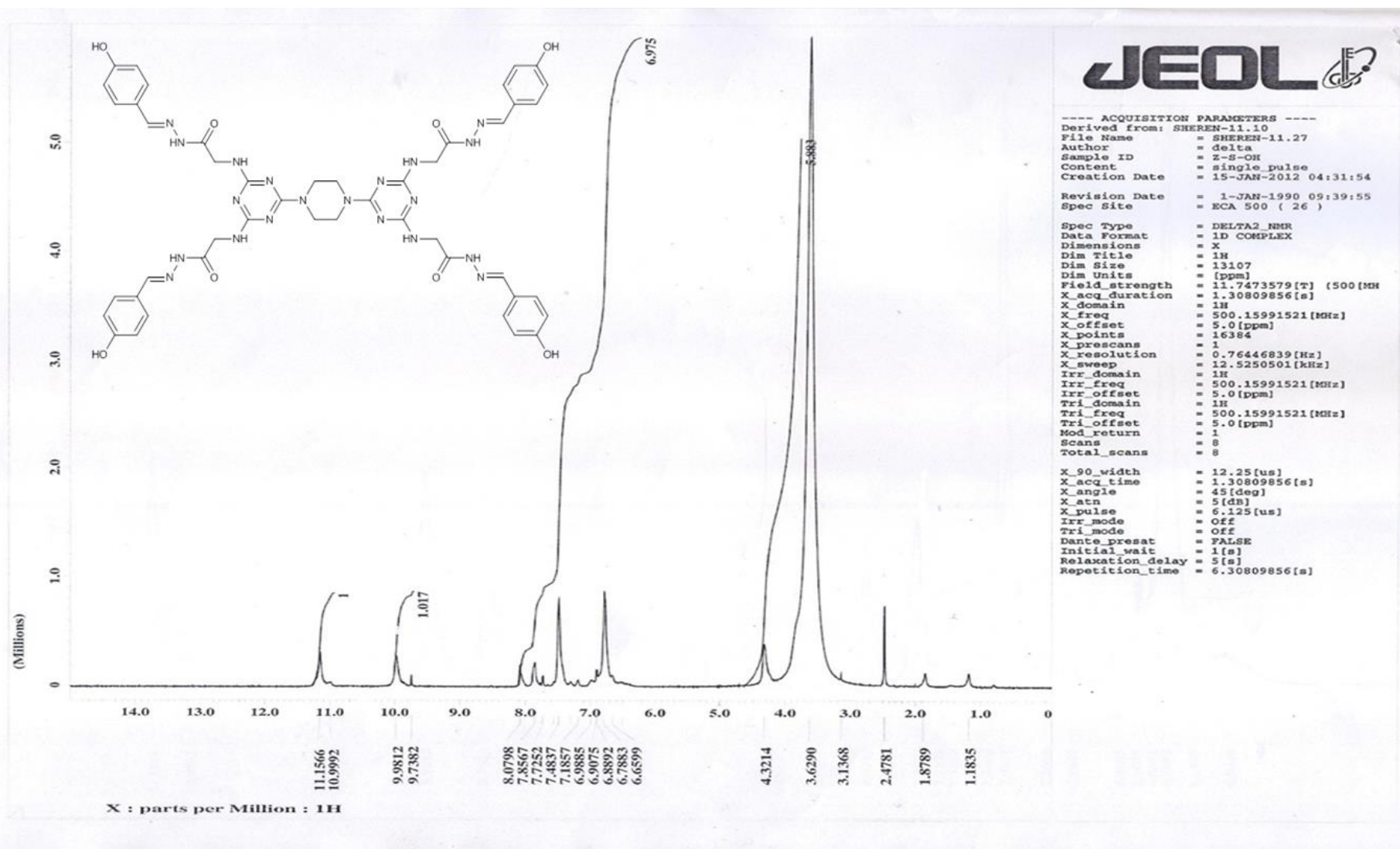


Figure 94: ^1H -NMR ($\text{DMSO-}d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-hydroxybenzylidene)acetohydrazide) **20g**.

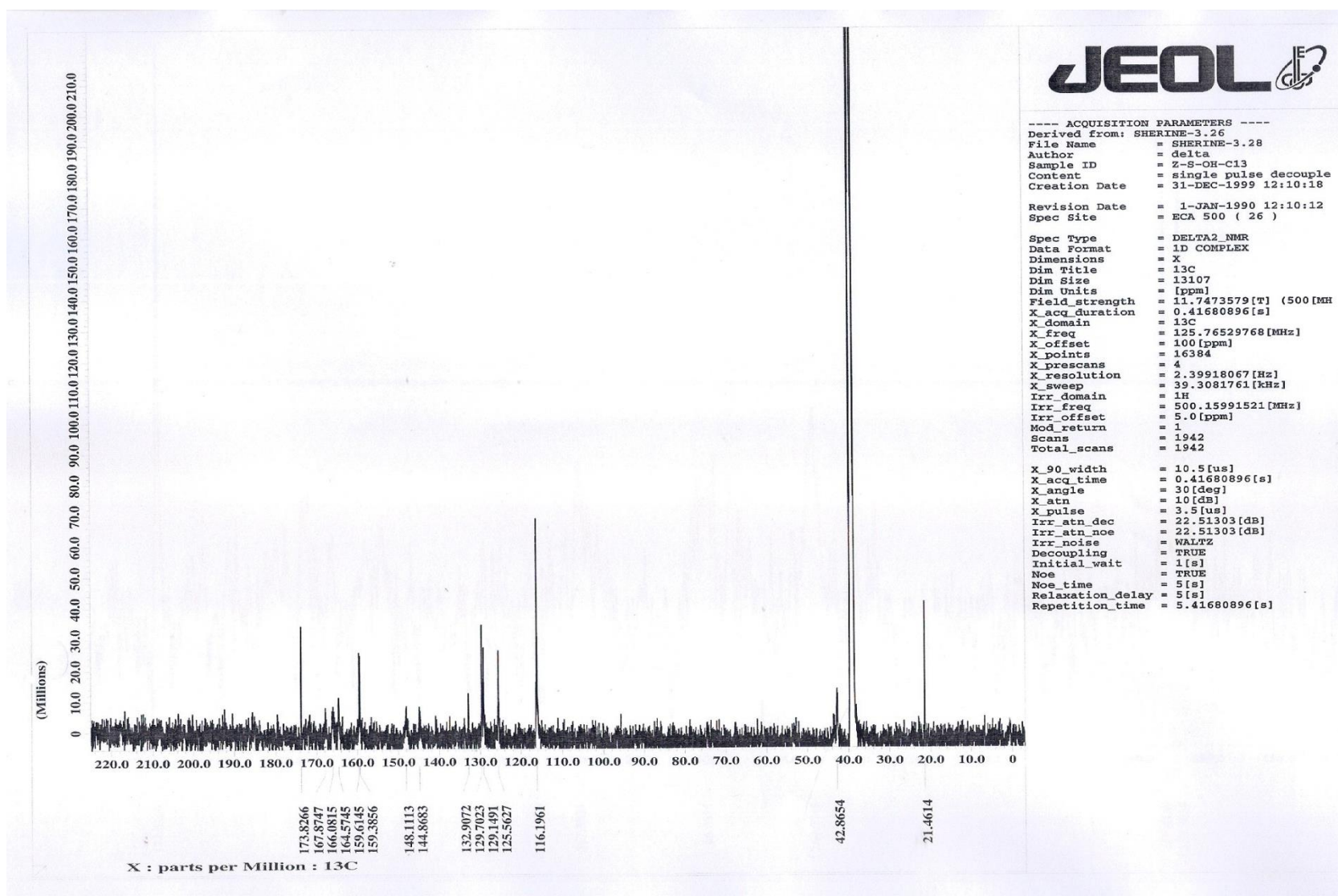


Figure 95: ^{13}C -NMR (DMSO- d_6) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(4-hydroxybenzylidene)acetohydrazide) **20g**.

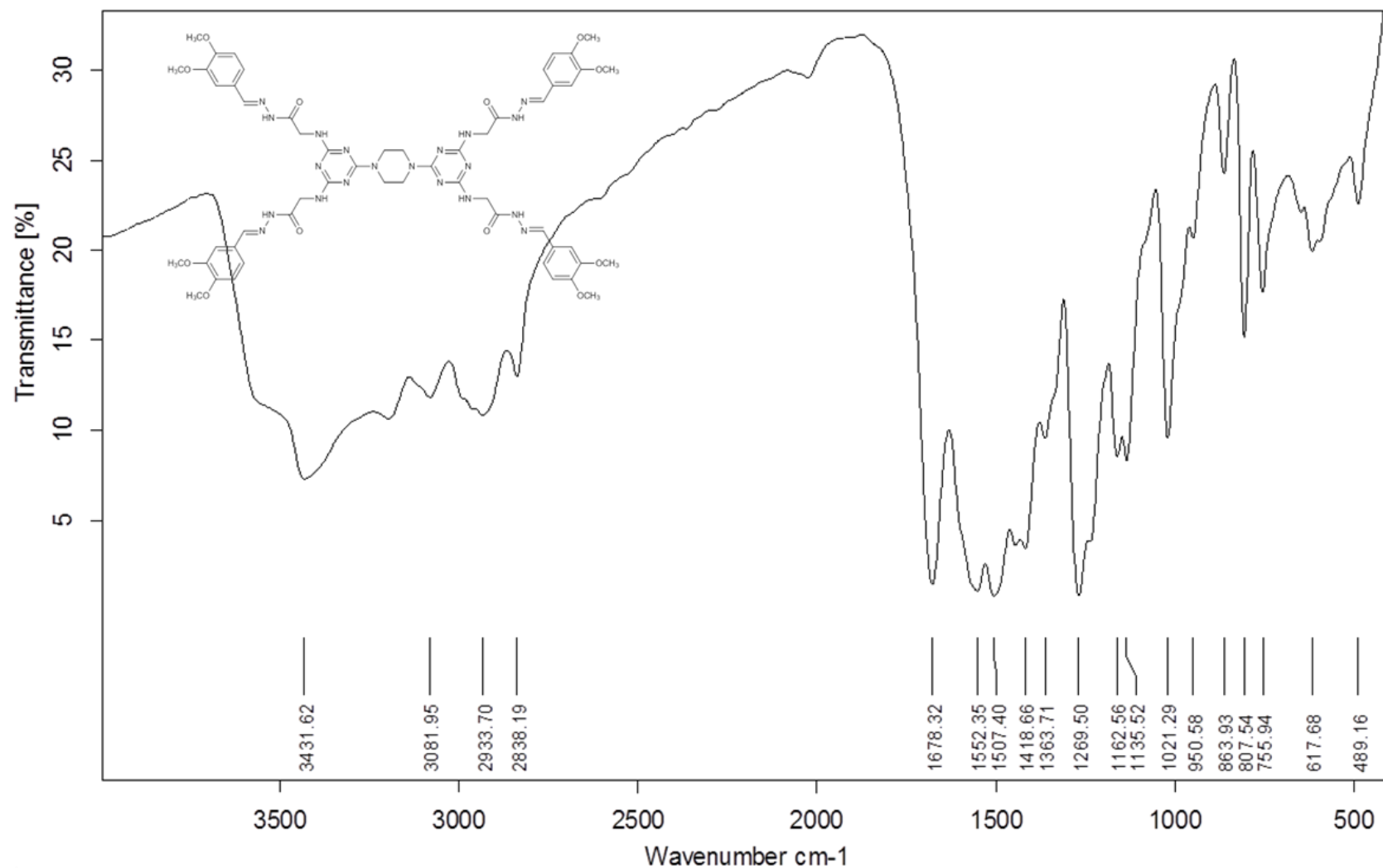


Figure 96: IR (KBr) spectrum of (*N'E,N'''E,N''''E,N'''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(3,4-dimethoxybenzylidene)acetohydrazide) **20h**.

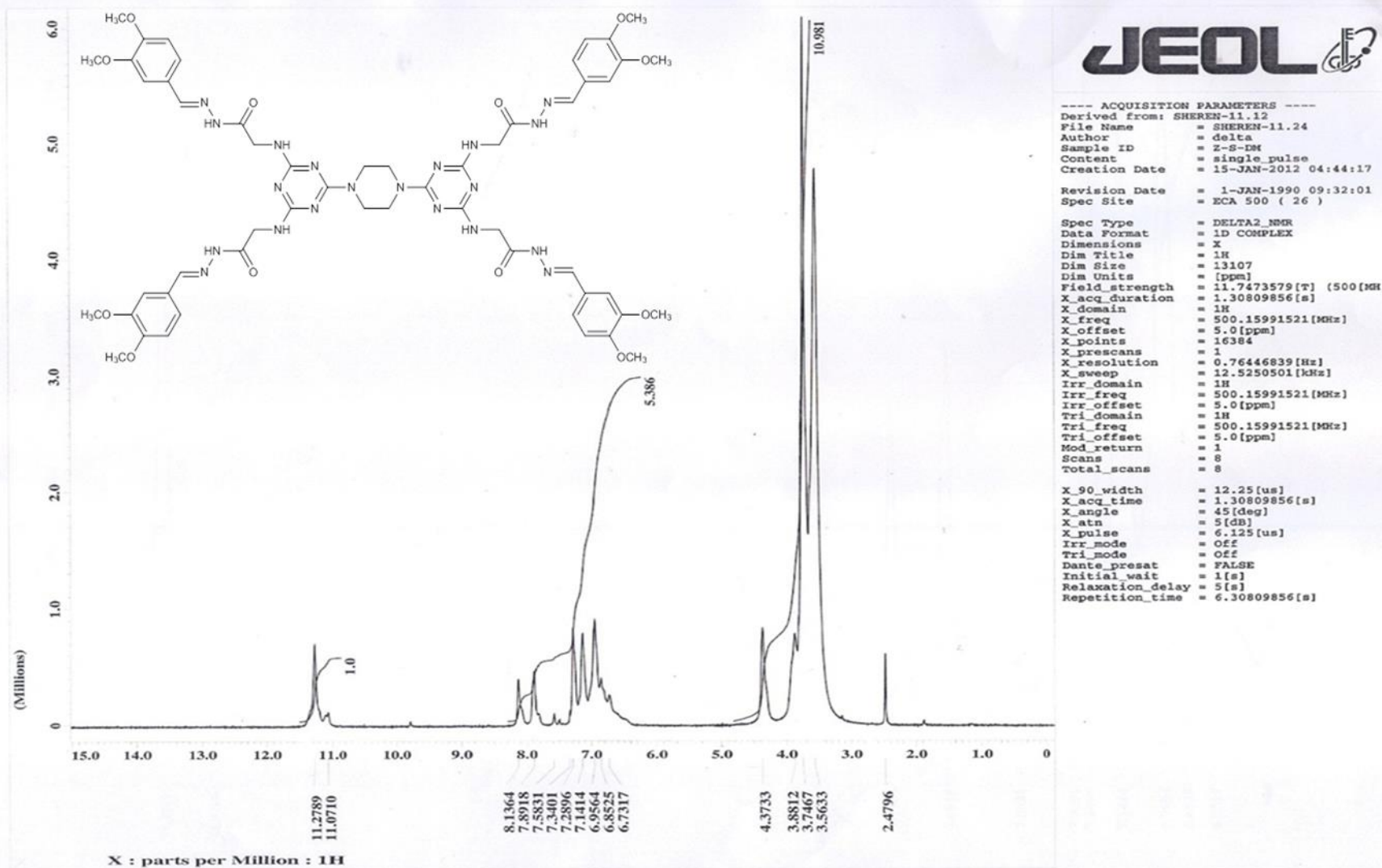


Figure 97: ¹H-NMR (DMSO-*d*₆) spectrum of (*N'E,N''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(3,4-dimethoxybenzylidene)acetohydrazide) **20h**.

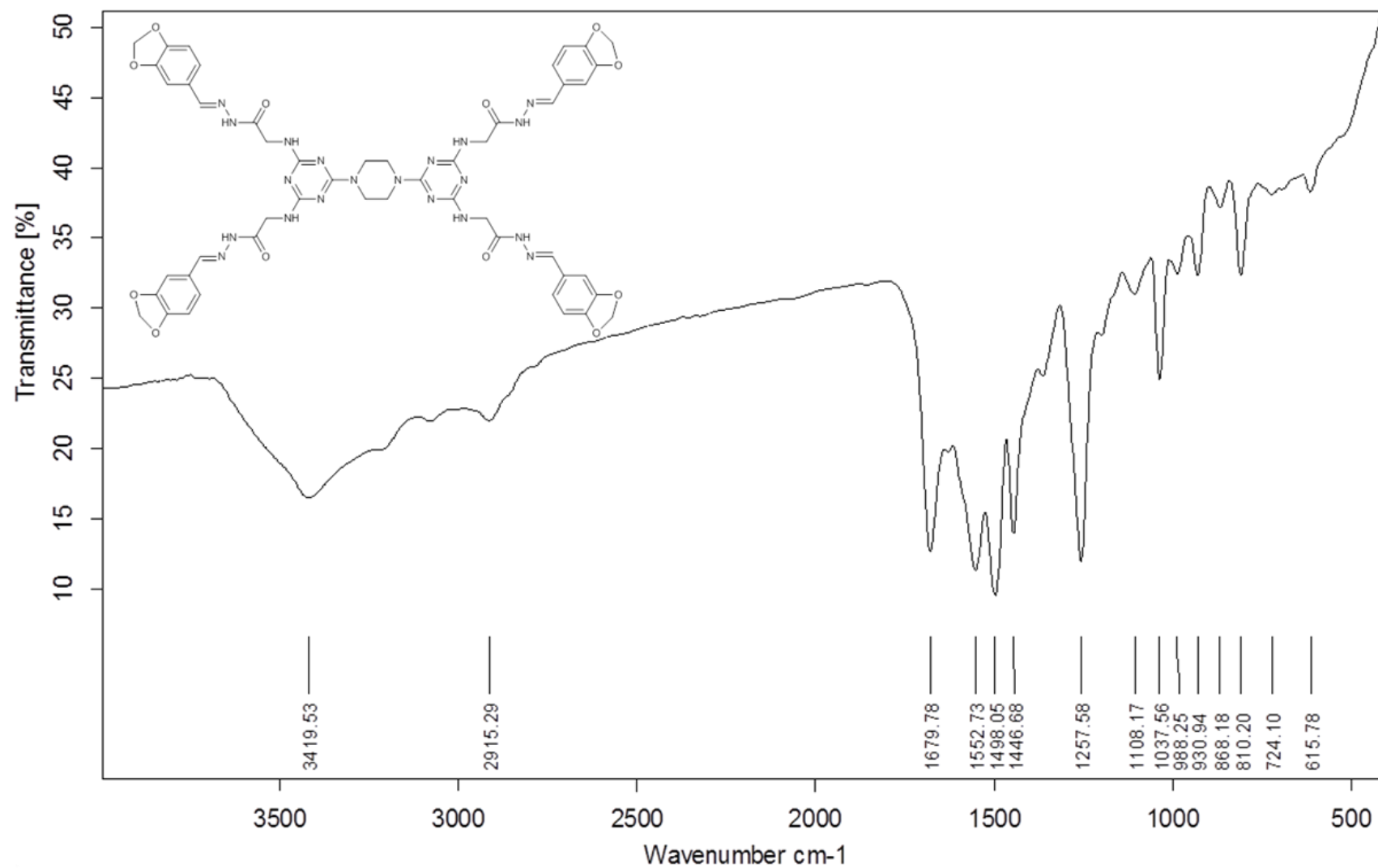


Figure 98: IR (KBr) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(benzo[d][1,3]dioxol-5-ylmethylene)acetohydrazide) **20i**.

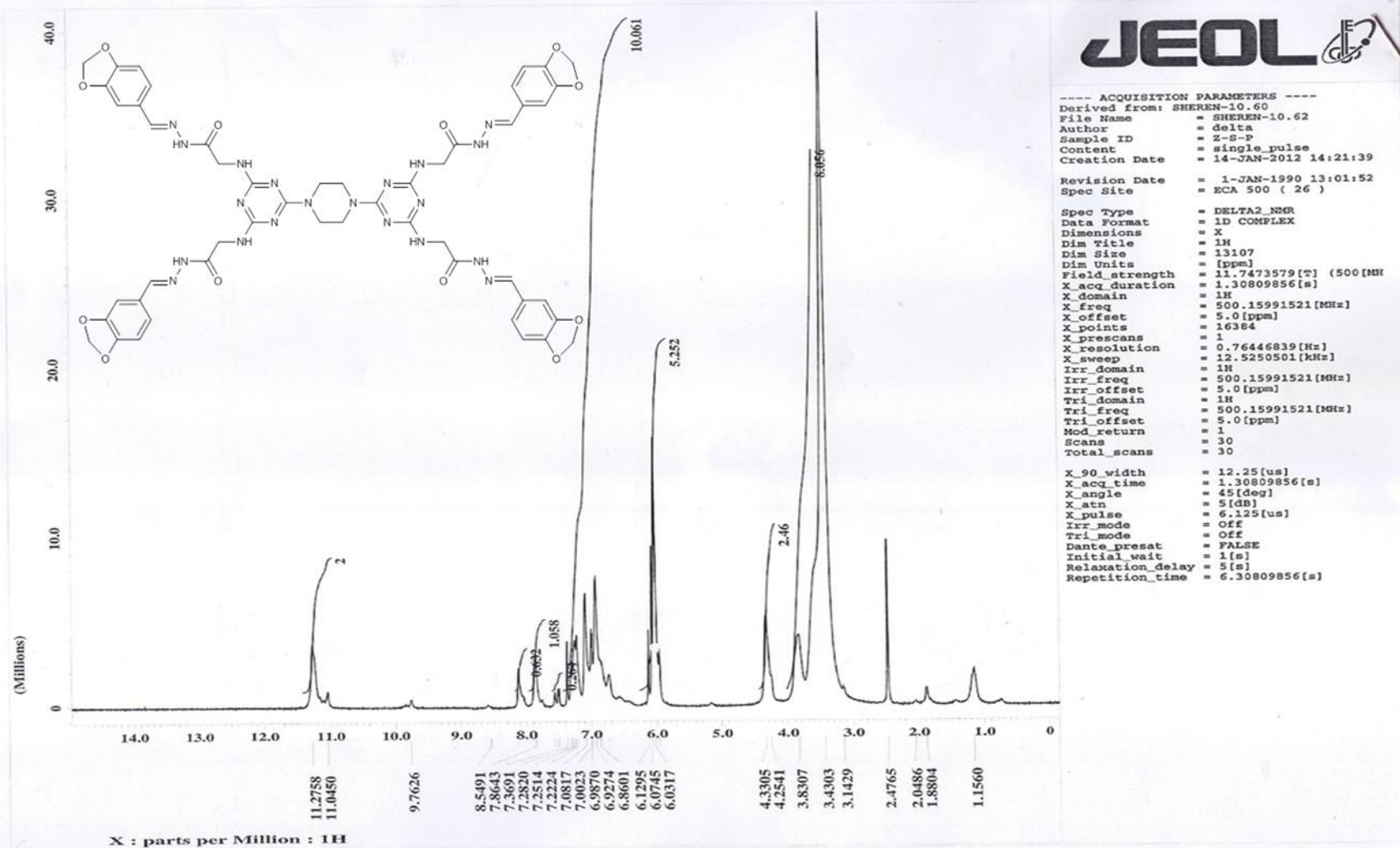


Figure 99: ^1H -NMR ($\text{DMSO}-d_6$) spectrum of $(N'E,N''E,N''''E,N''''''E)$ -2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(N' -(benzo[d][1,3]dioxol-5-ylmethylene)acetohydrazide) **20i**.

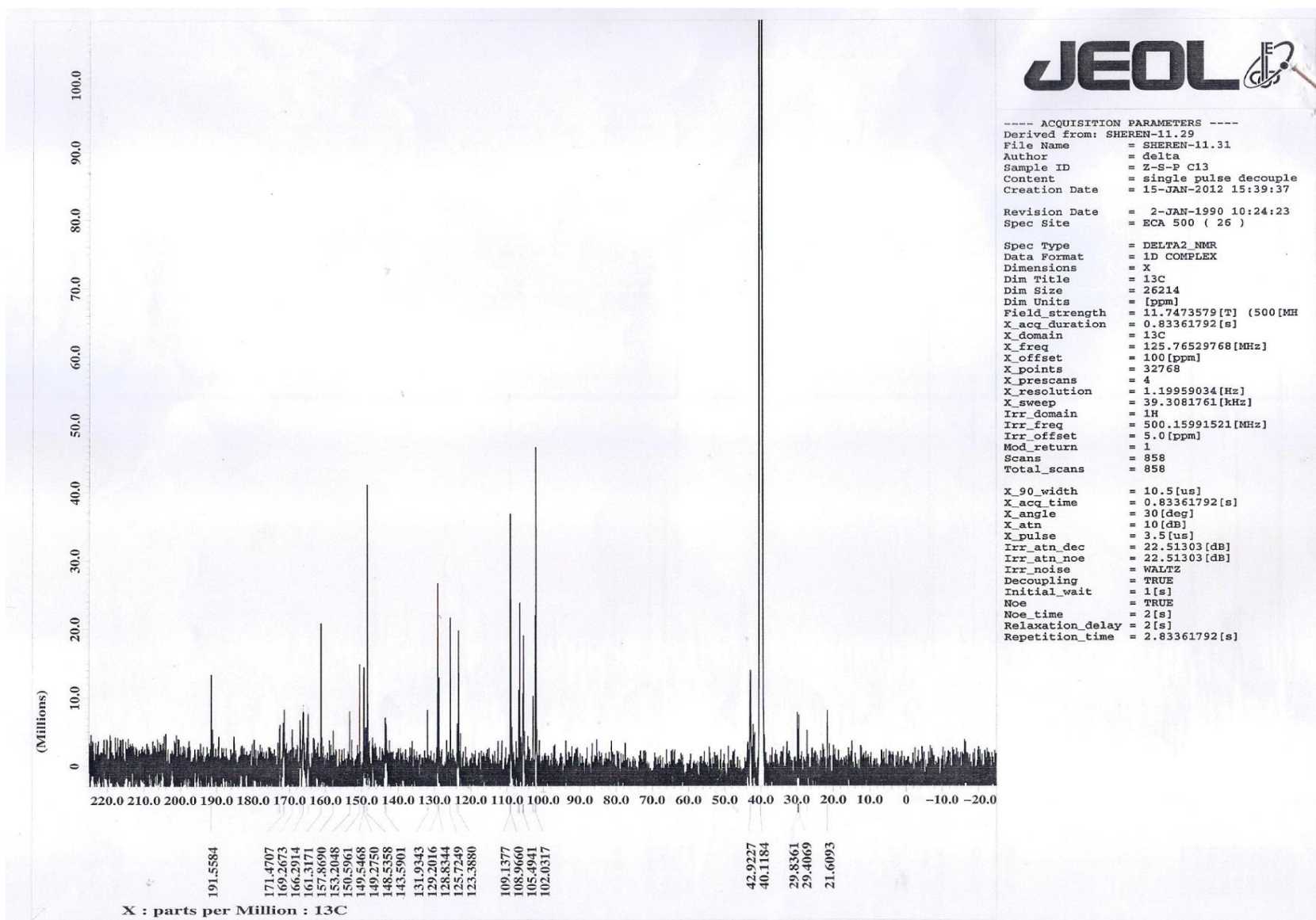


Figure 100: ^{13}C -NMR ($\text{DMSO}-d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(benzo[d][1,3]dioxol-5-ylmethylene)acetohydrazide) **20i**.

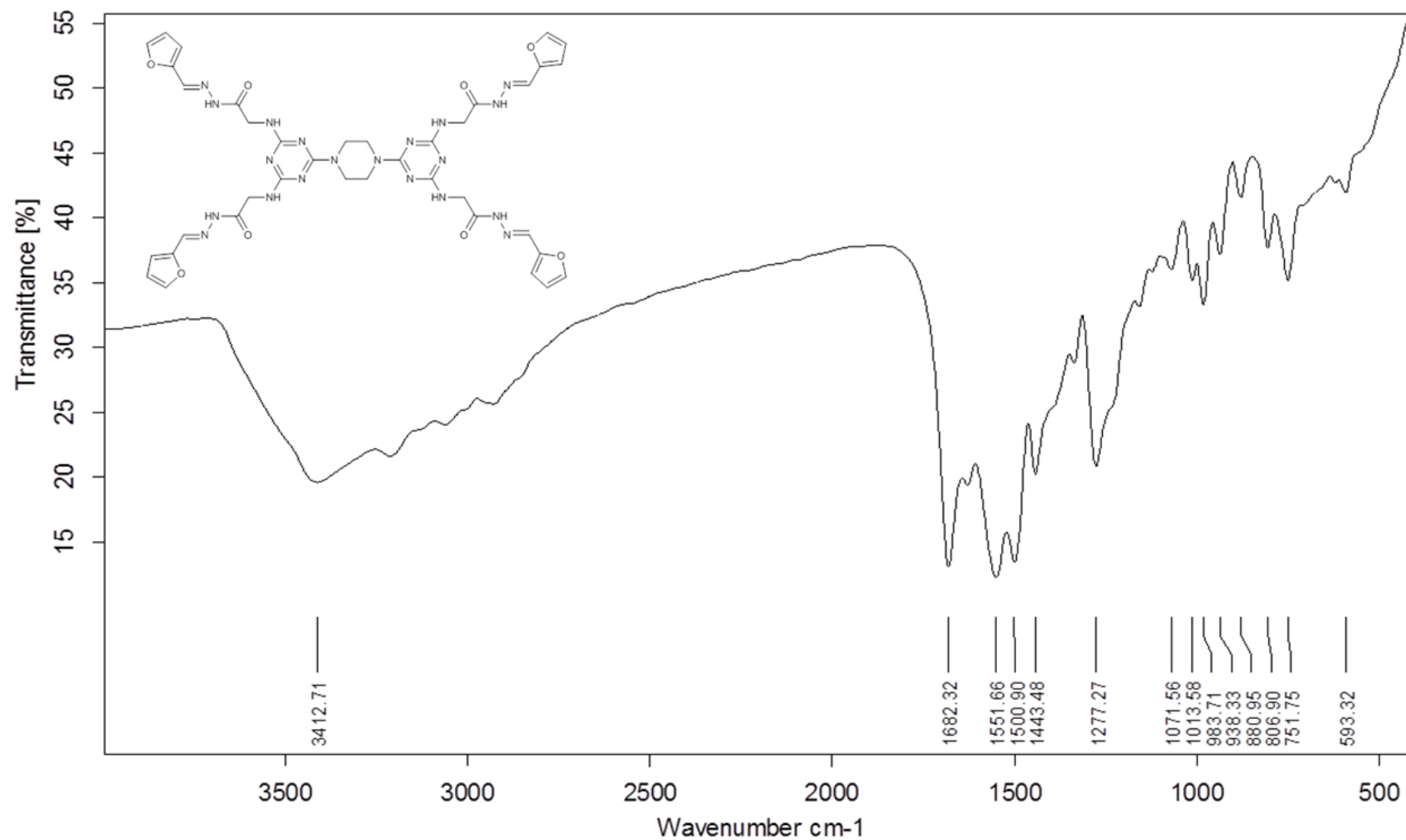


Figure 101: IR (KBr) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(furan-2-ylmethylene)acetohydrazide) **20j**.

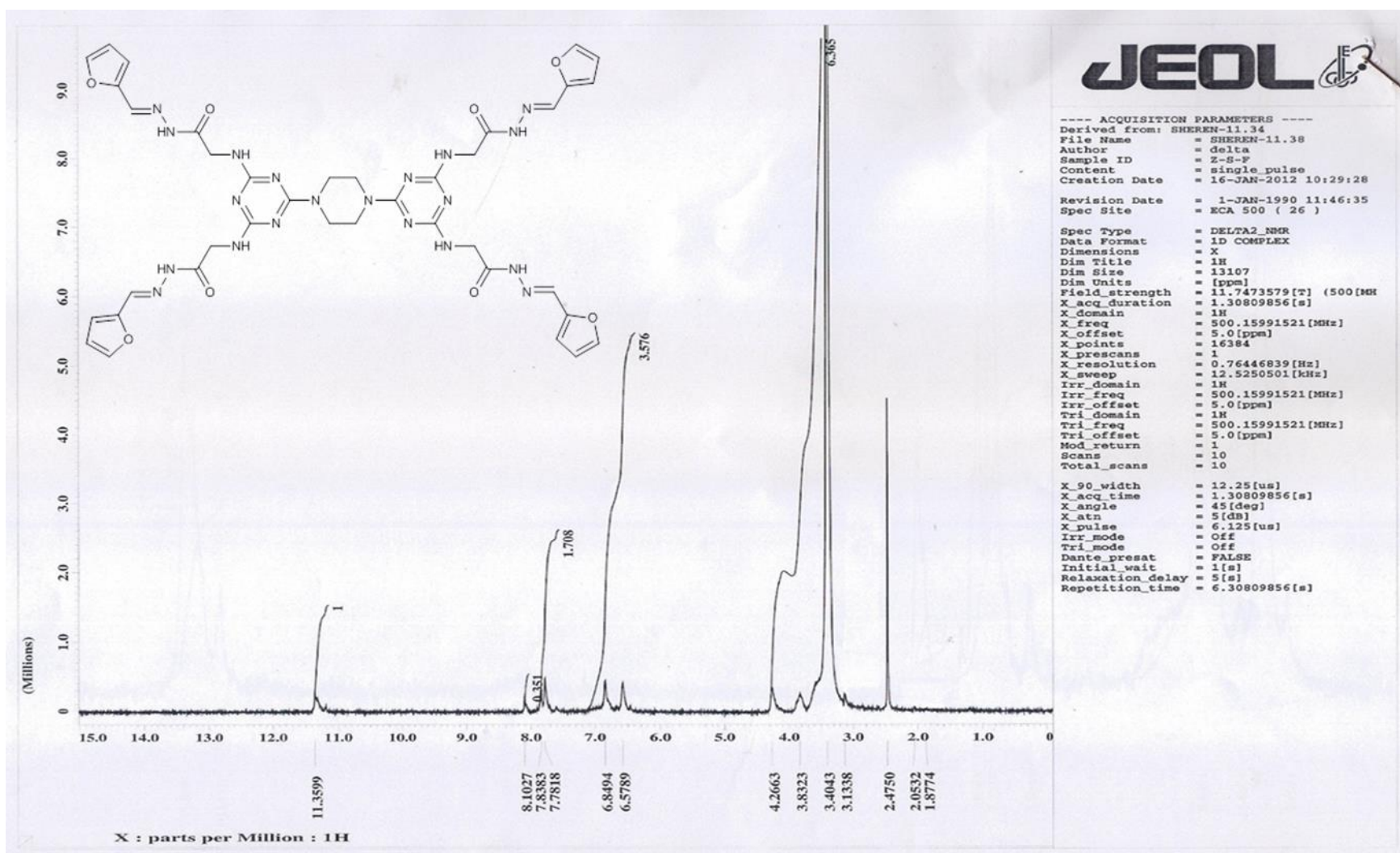


Figure 102: ^1H -NMR ($\text{DMSO-}d_6$) spectrum of (*N'E,N'''E,N''''E,N'''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(furan-2-ylmethylene)acetohydrazide) **20j**.

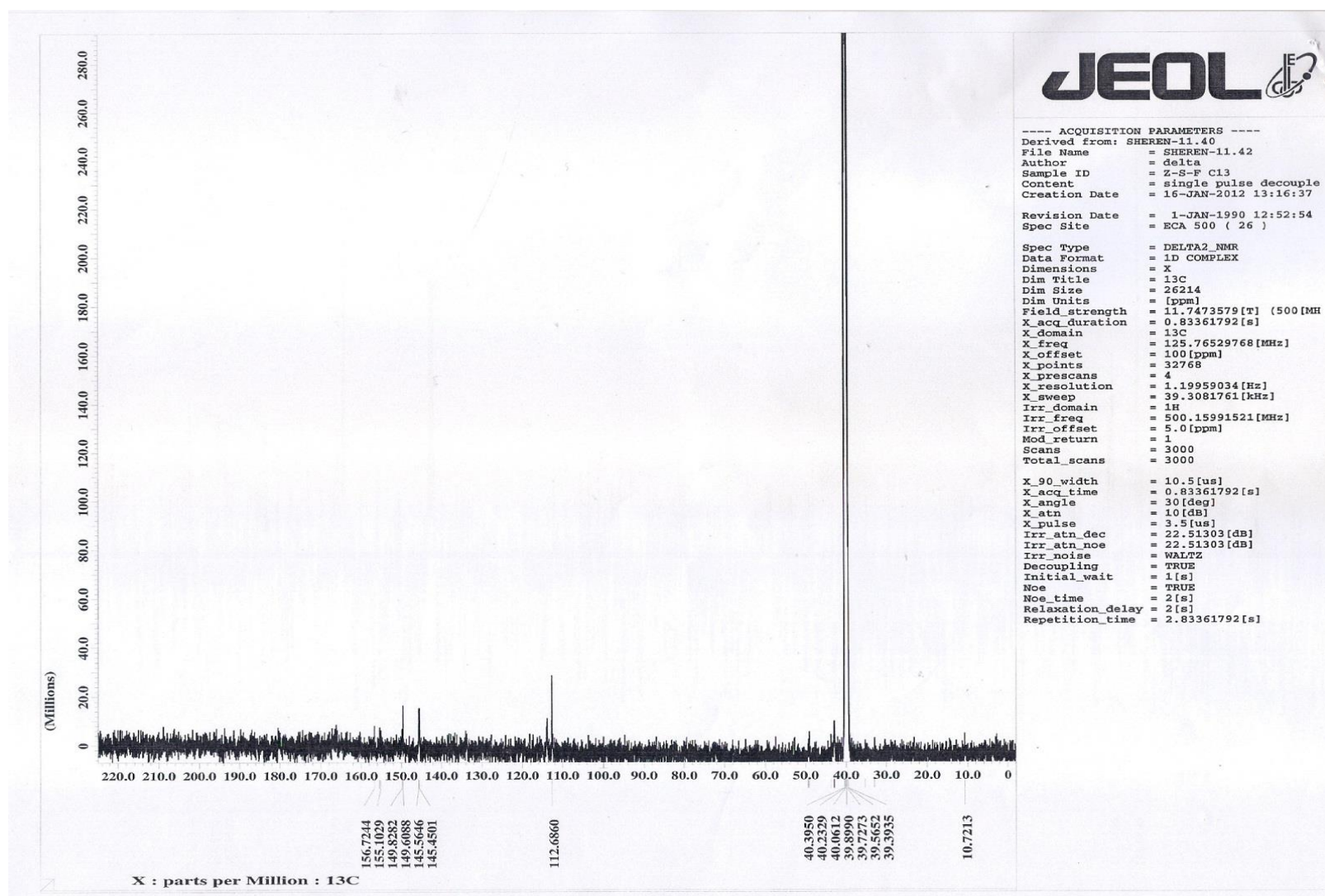


Figure 103: ^{13}C -NMR ($\text{DMSO}-d_6$) spectrum of (*N'E,N'''E,N''''E,N''''''E*)-2,2',2'',2'''-((6,6'-(piperazine-1,4-diyl)bis(1,3,5-triazine-6,4,2-triyl))tetrakis(azanediyl))tetrakis(*N'*-(furan-2-ylmethylene)acetohydrazide) **20j**.