Supplementary materials

Fe3O4@SiO2-MoO3H nanoparticles: a magnetically recyclable nanocatalyst system for the synthesis of 1,8-dioxo-decahydroacridine derivatives

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Abstract

Molybdic acid-functionalized silica-coated nano-Fe_3O_4 particles (Fe_3O_4@SiO_2-MoO_3H) have been prepared as a novel heterogeneous acid catalyst using a facile process. The material was subsequently identified as an efficient catalyst for the synthesis of 1,8-dioxo-decahydroacridine derivatives under solvent free conditions. The catalyst could be readily recovered using a simple external magnet and reused several times without any significant loss in activity. Short reaction time, excellent yields and simple work-up are the advantages of this procedure.

Keywords: Fe_3O_4@SiO_2-MoO_3H; Novel heterogeneous acid catalyst; 1,8-Dioxo-decahydroacridine; Solvent free conditions; Excellent yields

Supplementary materials

9-phenyl-3,4,6,7,9,10-hexahydroacridine-1,8(2H,5H)-dione (7a)

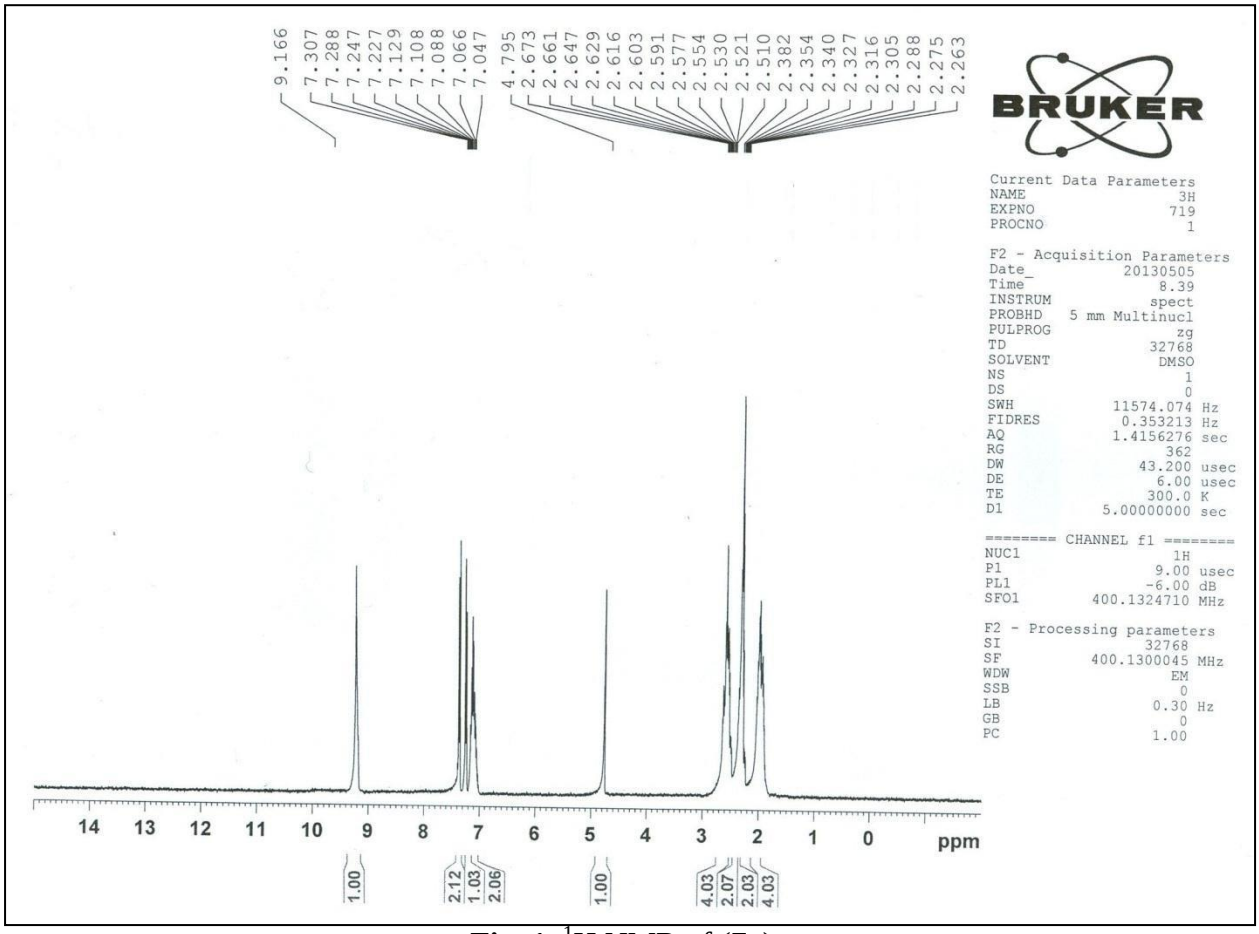

Fig. 1. ^{1}H NMR of (**7a**).

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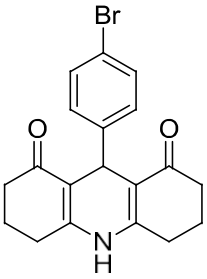
9-(4-bromophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2H,5H)-dione (7c)



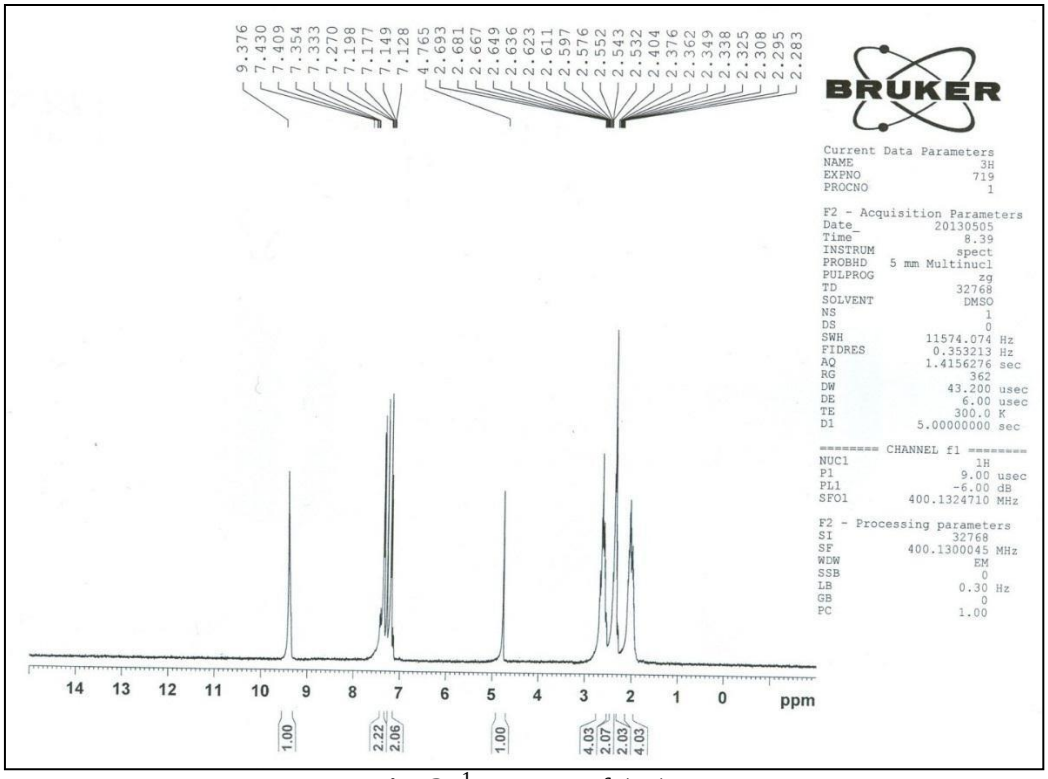


Fig. 2. ^{1}H NMR of (**7c**).

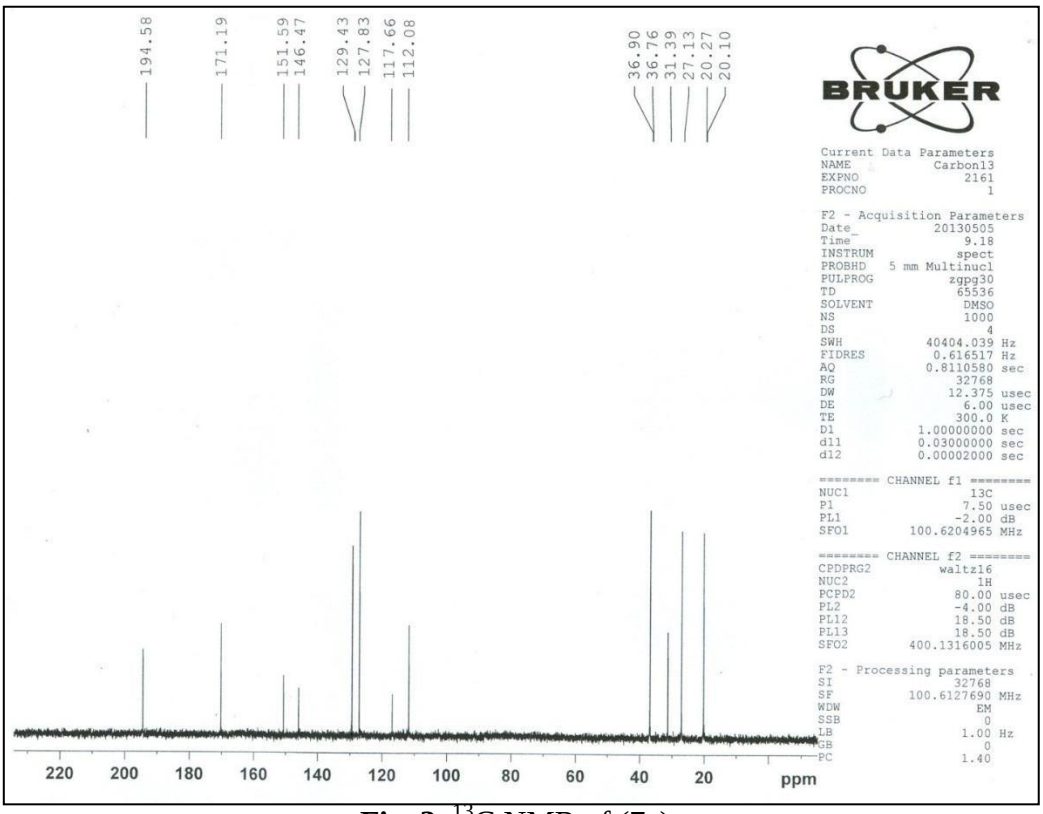
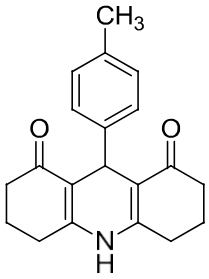


Fig. 3. ^{13}C NMR of (**7c**).

Supplementary materials

9-(p-tolyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2H,5H)-dione (7d)



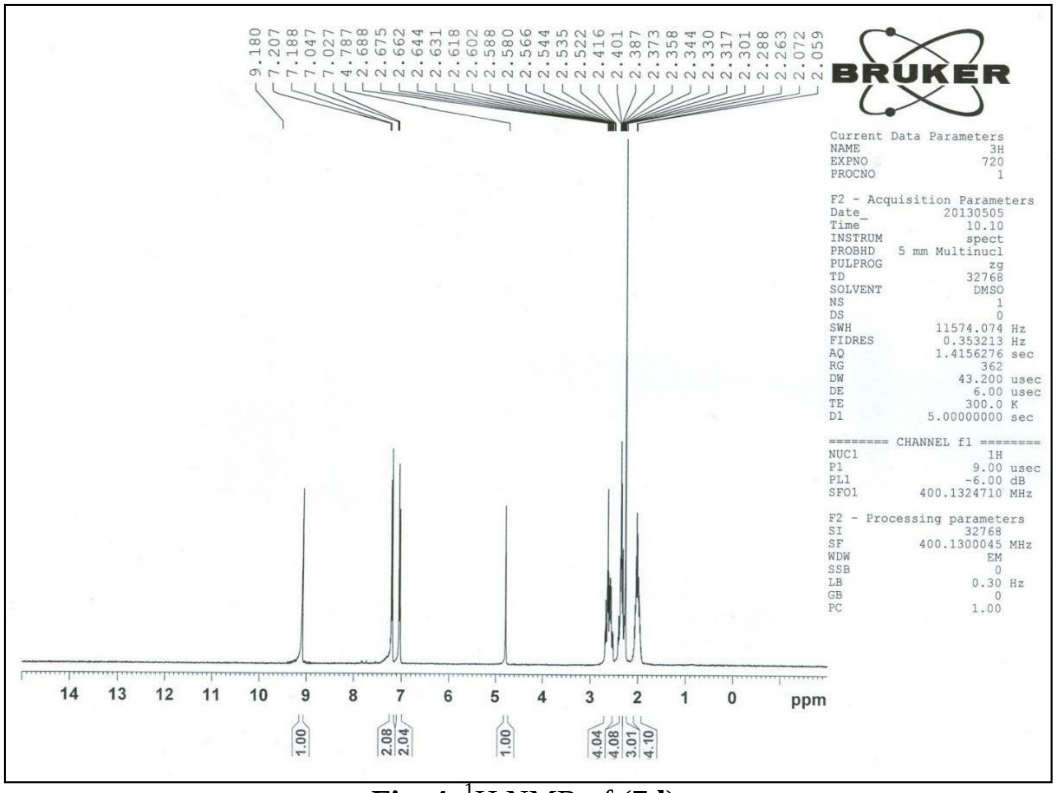


Fig. 4. ^{1}H NMR of (**7d**).

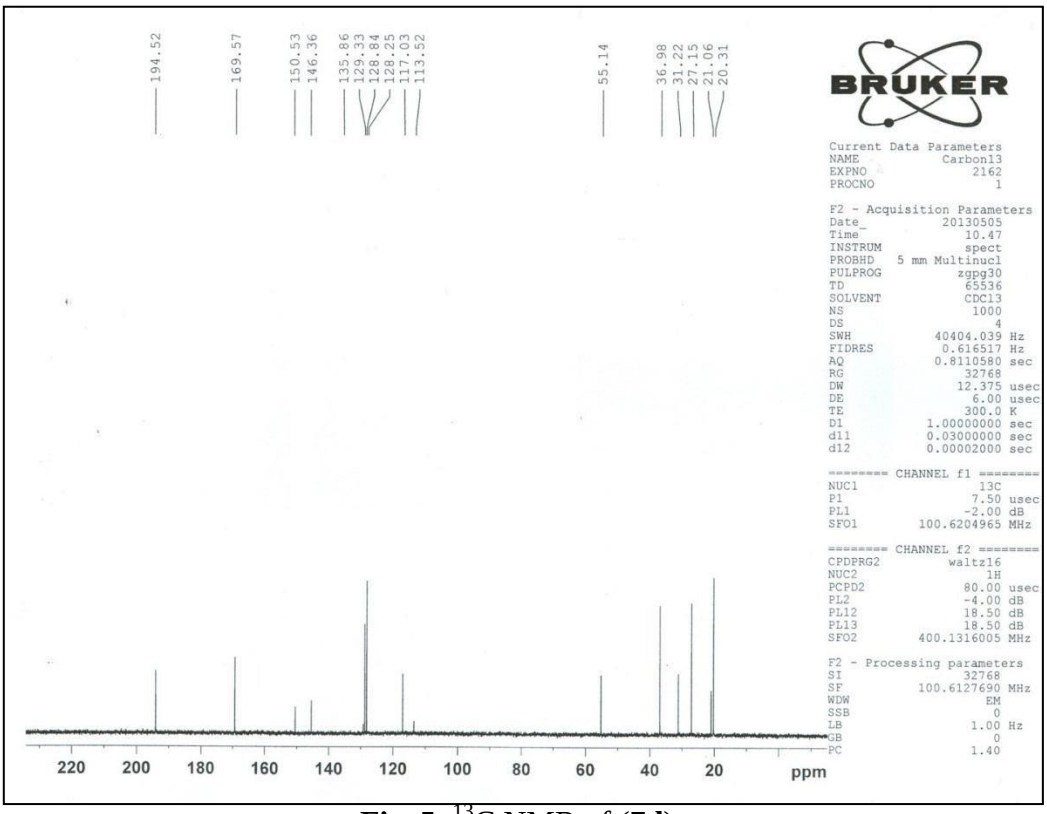


Fig. 5. ^{13}C NMR of (**7d**).

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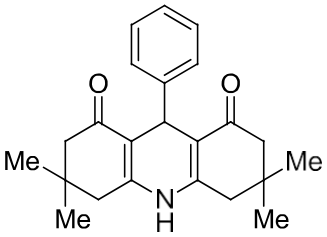
3,3,6,6-tetra methyl-9-phenyl-3,4,6,7,9,10-hexahydroacridine-1,8-(2H,5H)-dione (8a)



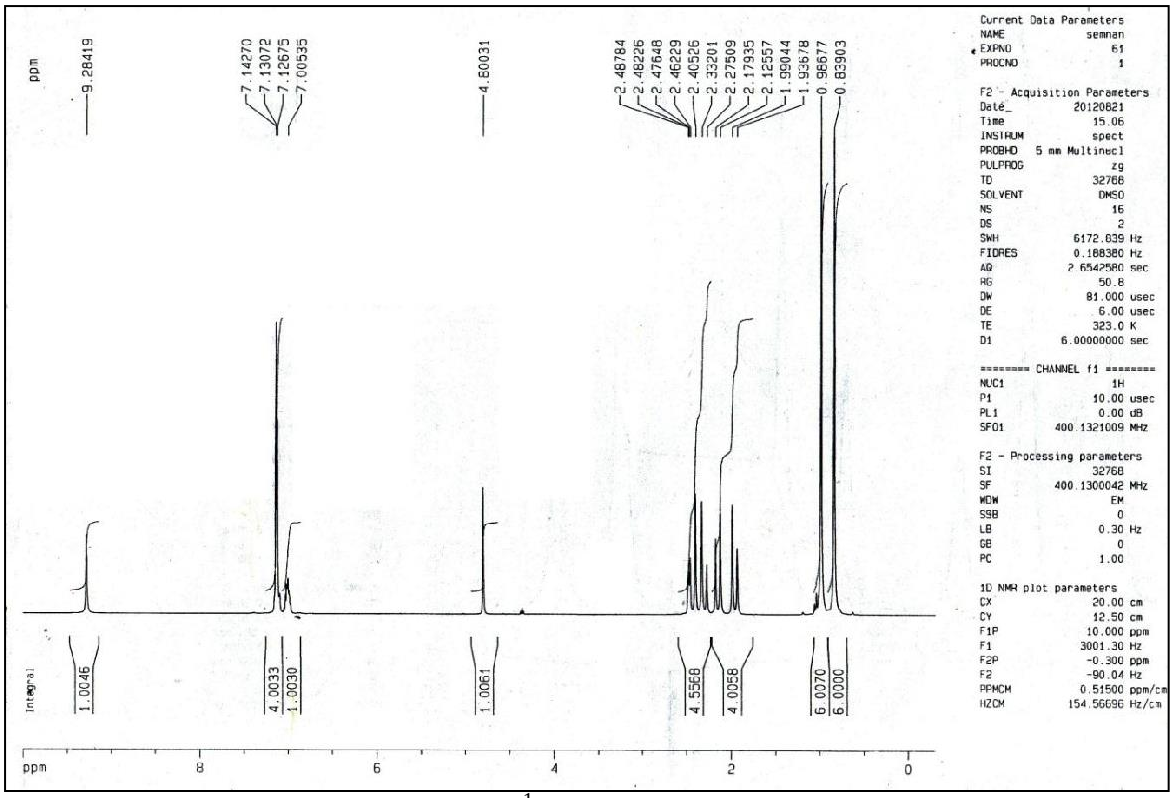


Fig. 6. ^{1}H NMR of (**8a**).

Supplementary materials

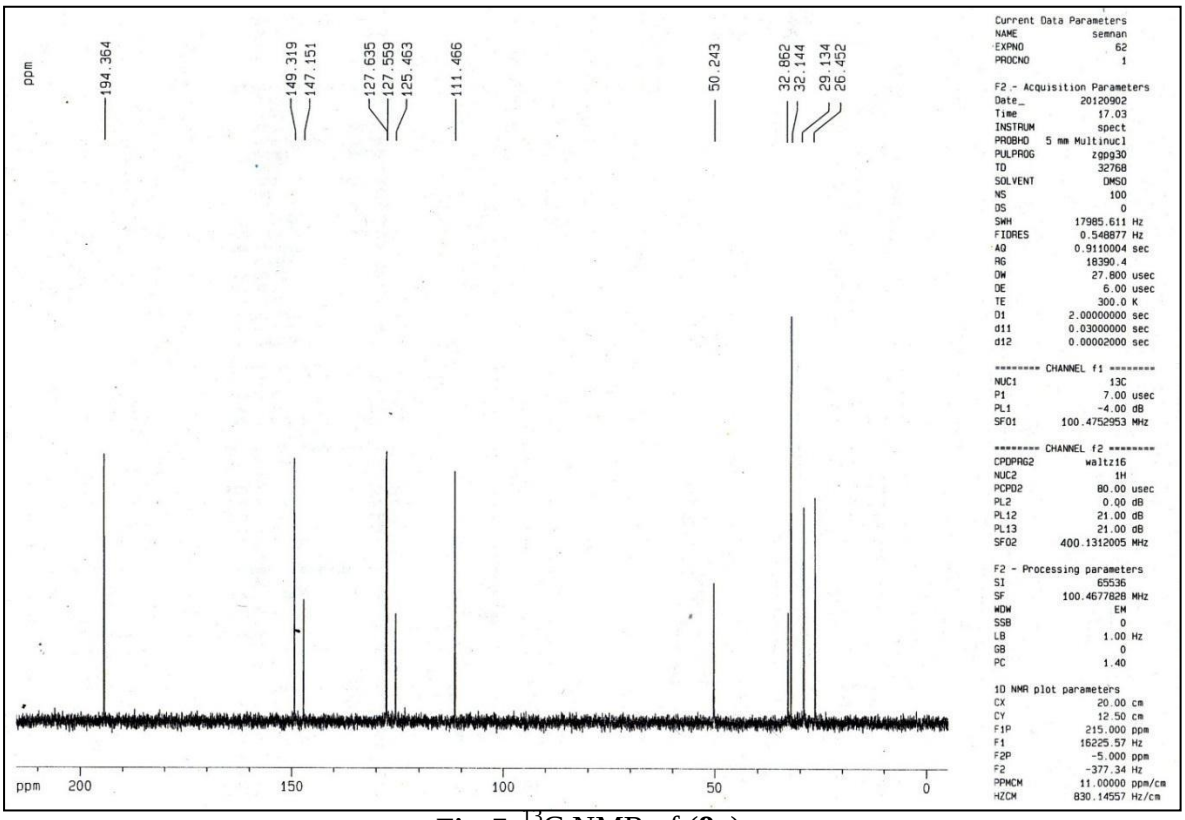


Fig. 7. ^{13}C NMR of (**8a**).

9-(4-methoxyphenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2H,5H)-dione (8b)

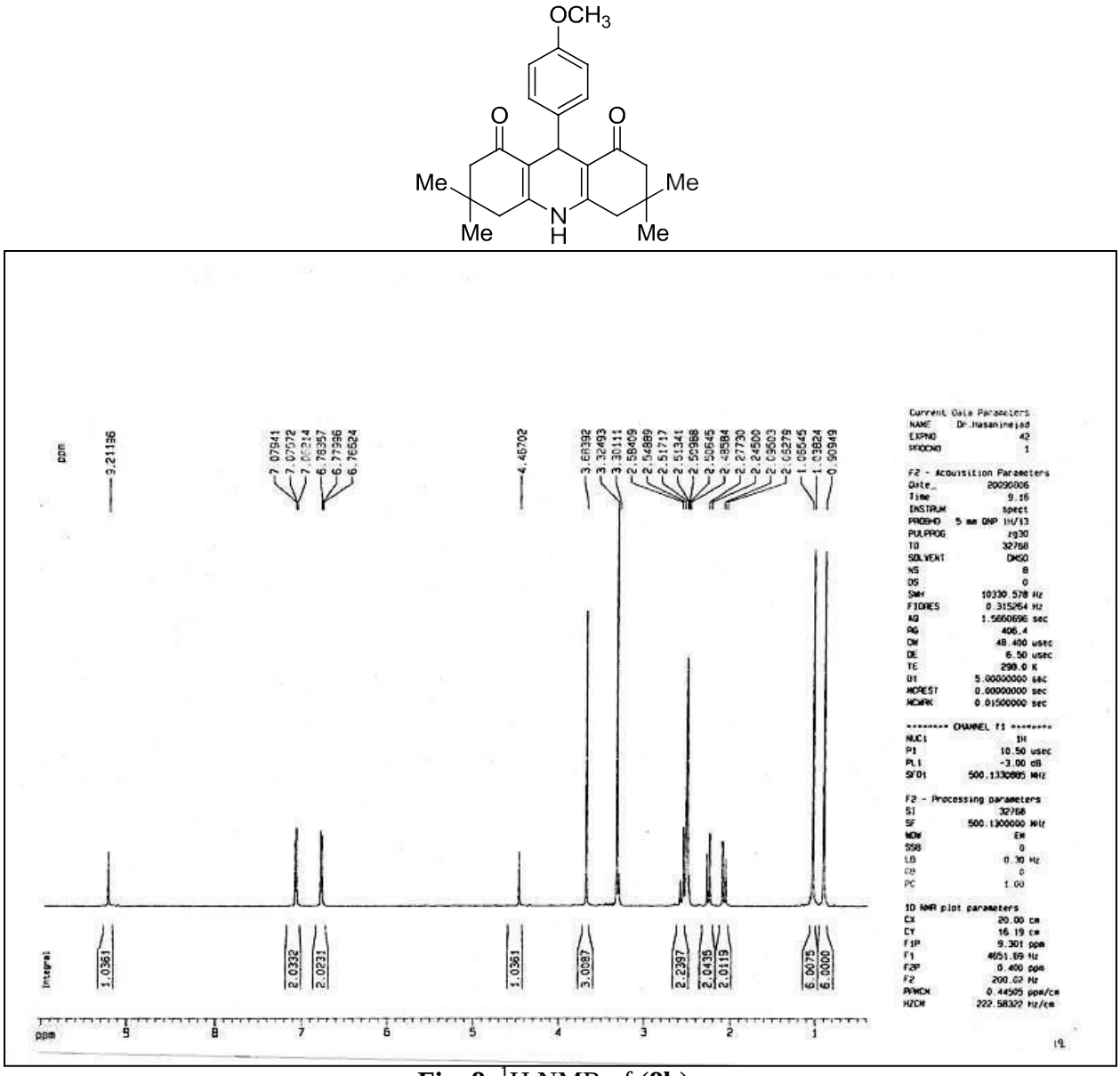


Fig. 8. ^{1}H NMR of (**8b**).

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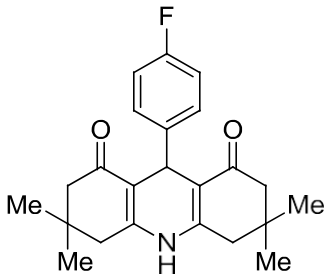
9-(4-fluorophenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2H,5H)-dione (8e)



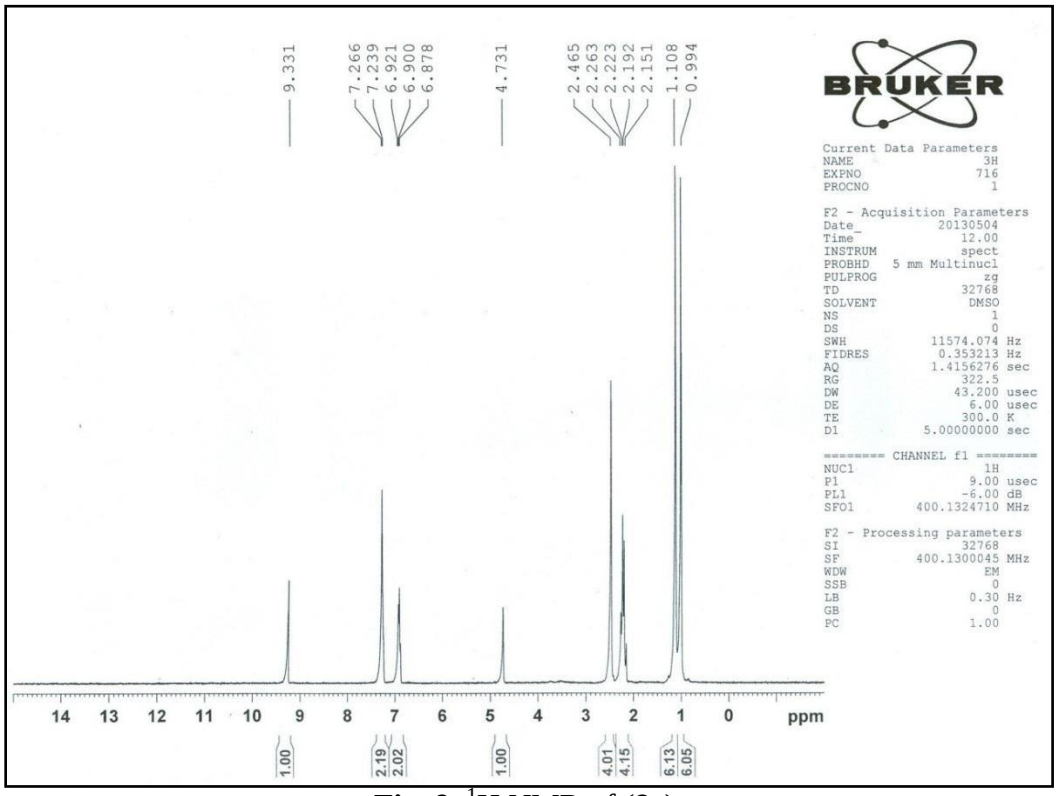


Fig. 9. ^{1}H NMR of (**8e**).

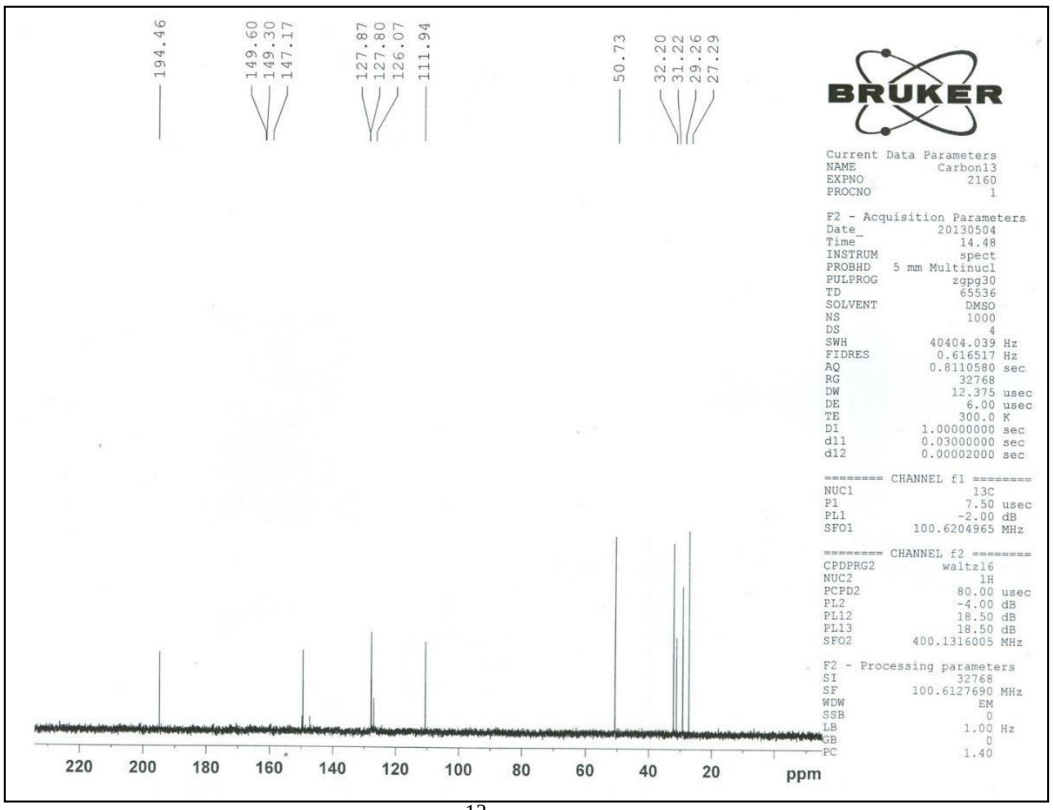


Fig. 10. ^{13}C NMR of (**8e**).

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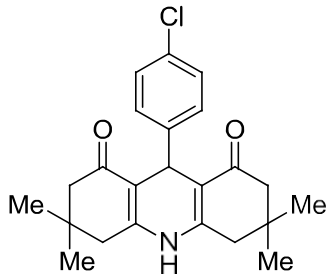
9-(4-chlorophenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2H,5H)-dione (8f)



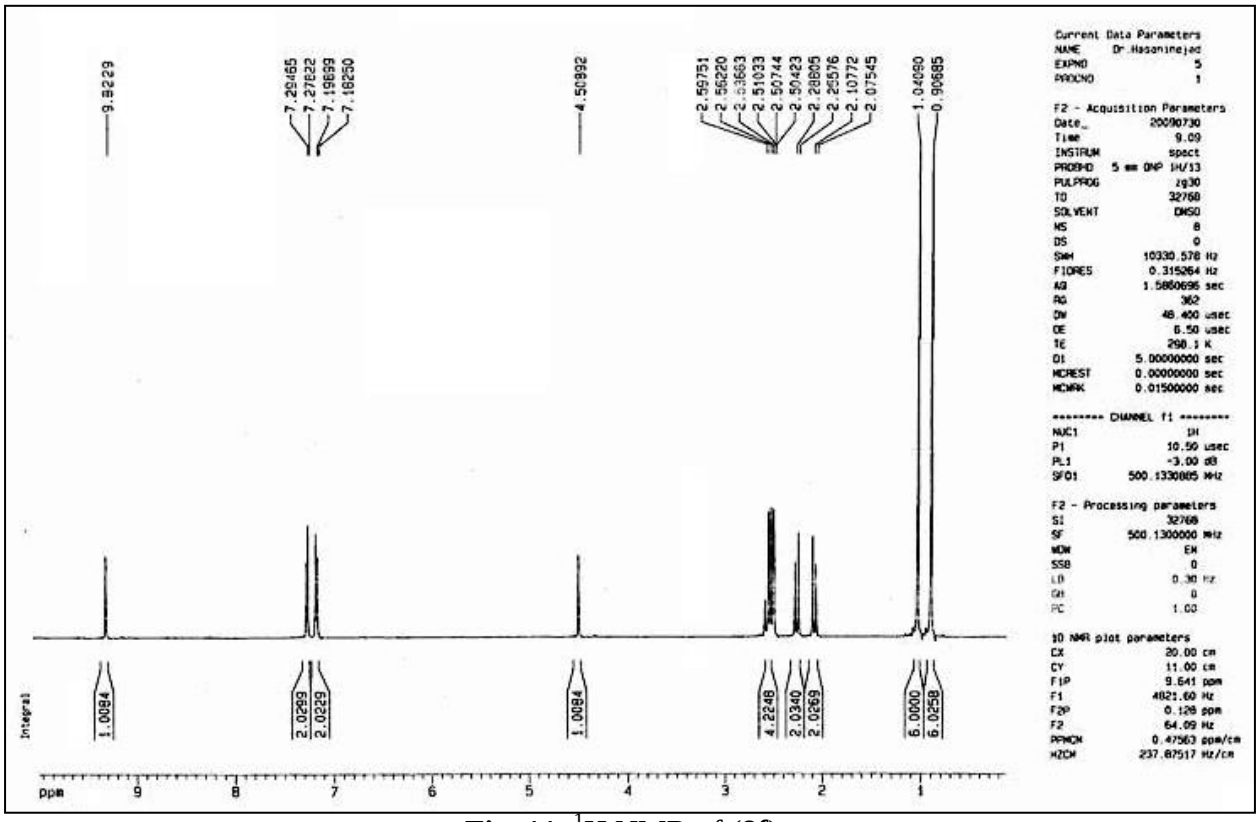
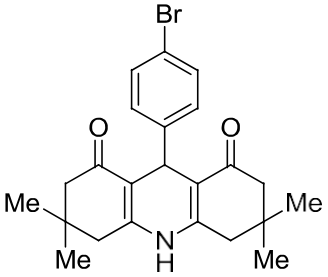


Fig. 11. ^{1}H NMR of (**8f**).

Supplementary materials

9-(4-bromophenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2H,5H)-dione (8h)



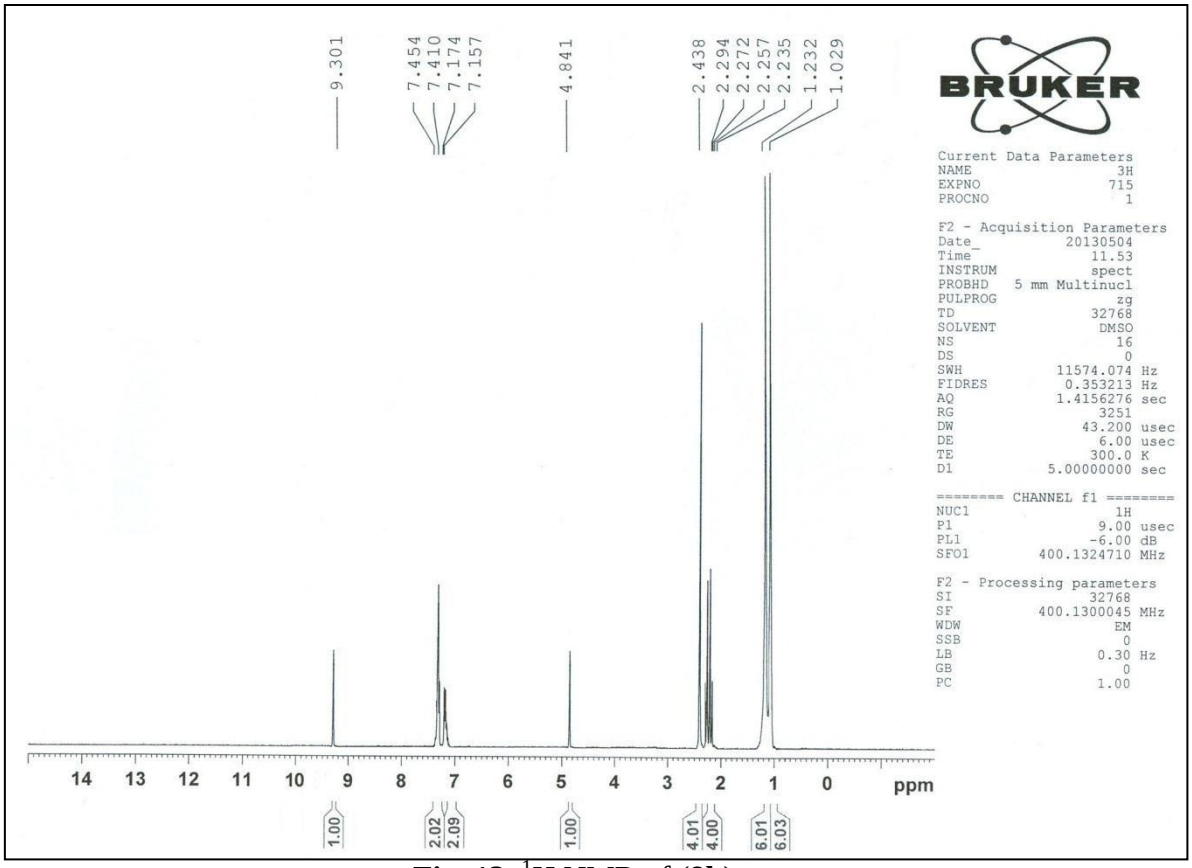


Fig. 12. ^{1}H NMR of (**8h**).

3,3,6,6-tetramethyl-9-(4-nitrophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2H,5H)-dione (8i)

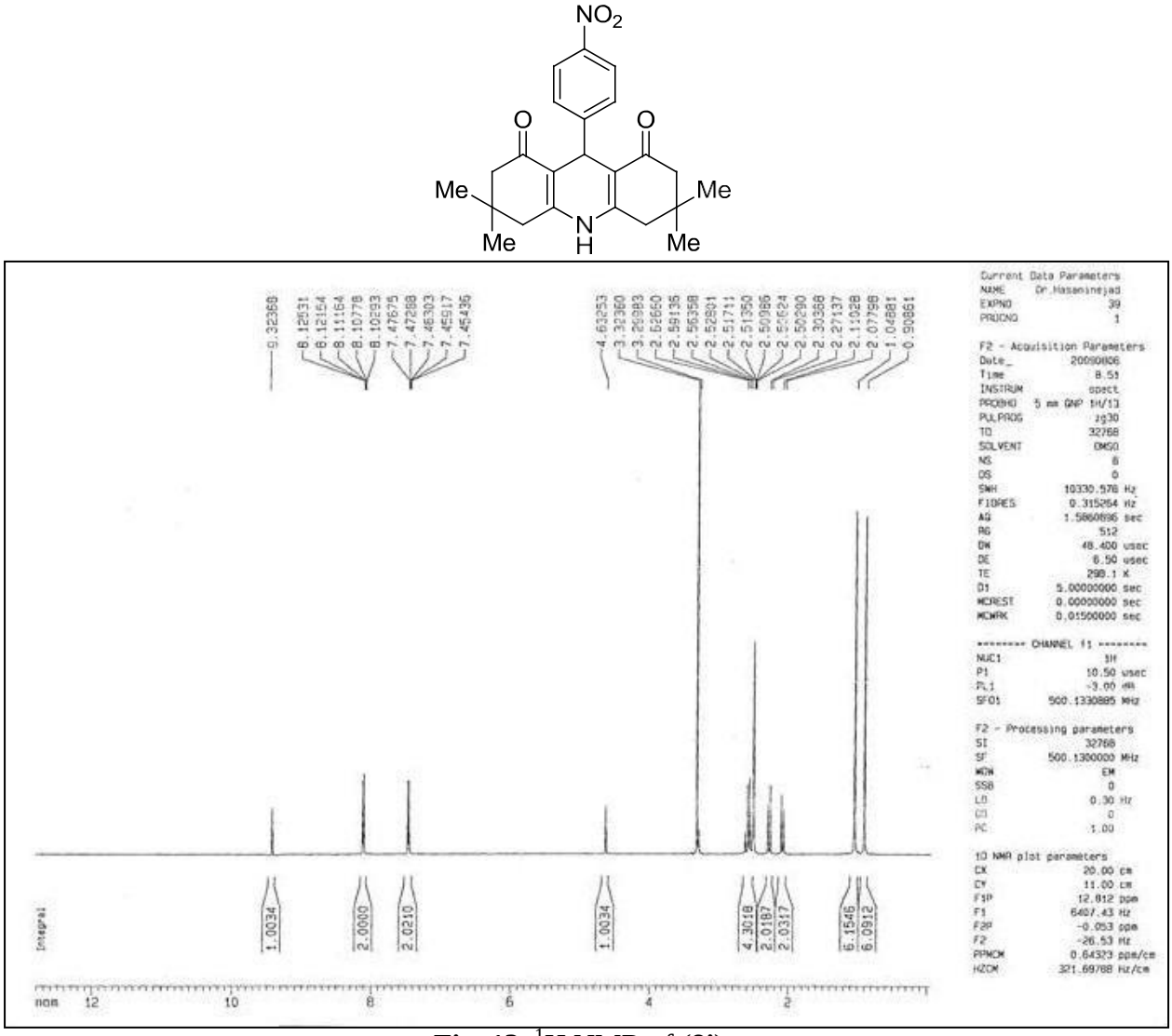
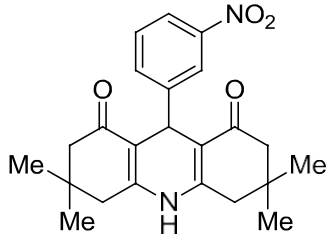


Fig. 13. ^{1}H NMR of (**8i**).

Supplementary materials

3,3,6,6-tetramethyl-9-(3-nitrophenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2H,5H)-dione (8j)



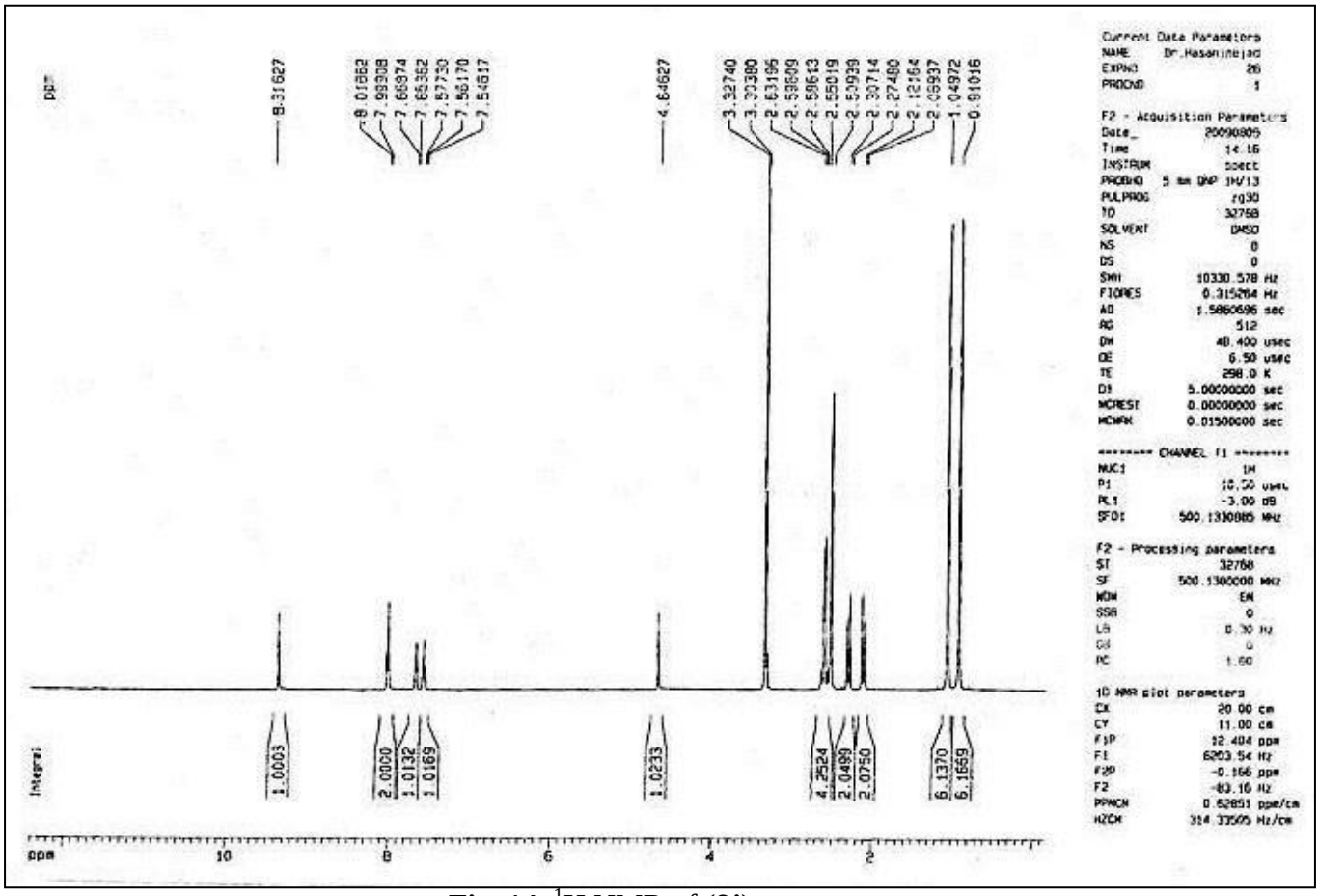


Fig. 14. ^{1}H NMR of (**8j**).

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3,3,6,6-tetramethyl-9-(naphthalen-2-yl)-3,4,6,7,9,10-hexahydroacridine-1,8(2H,5H)-dione (8k)

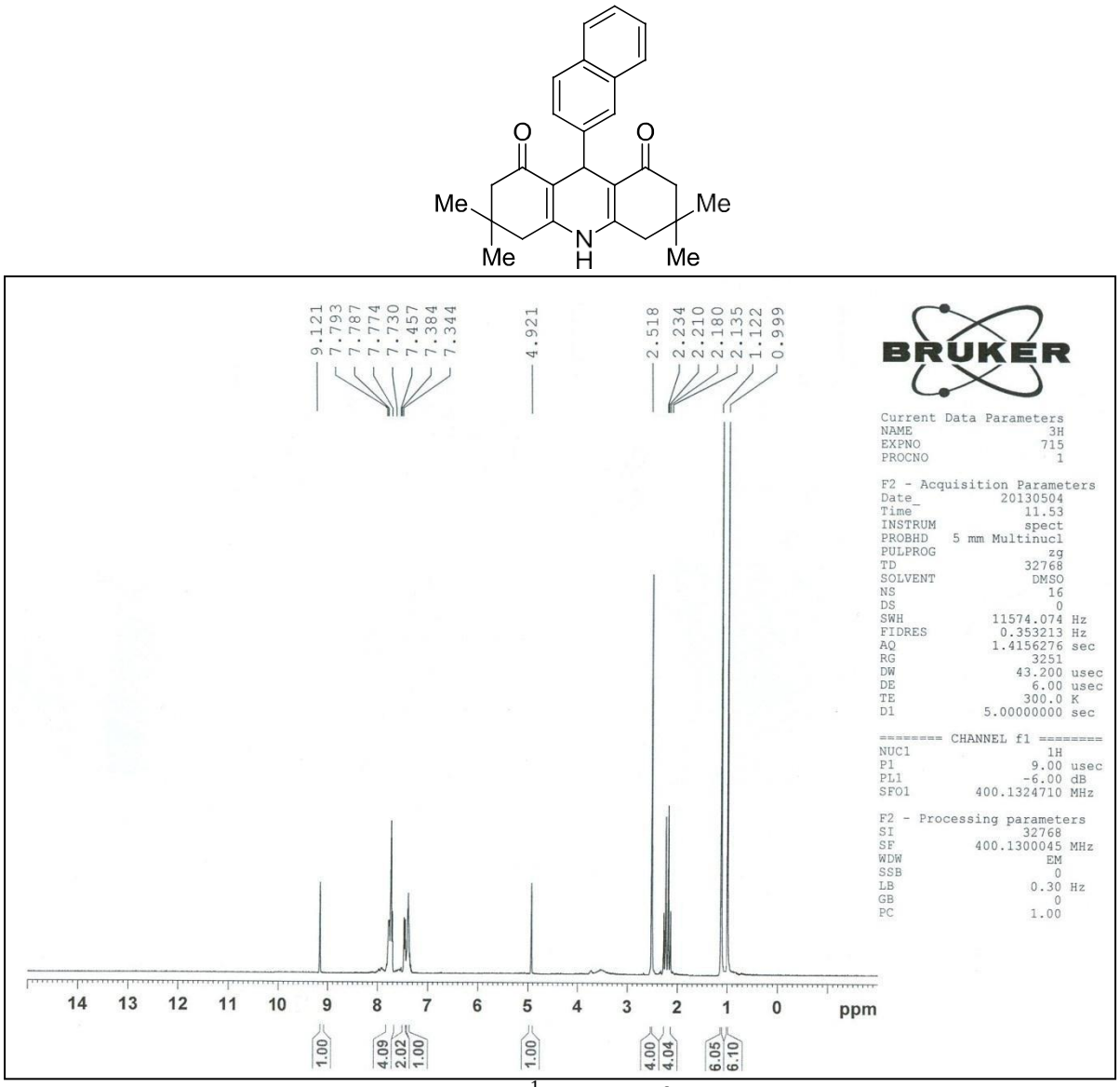

Fig. 15. ^{1}H NMR of (**8k**).