

# Some new synthesized of 1-N-(substituted)- azacoumarin- 3- carboxylic acid derivatives functioning as anti-cancer drugs

Ahmed Gaber<sup>1,2</sup>, Walaa F. Alsanie<sup>2,3</sup>, Majid Alhomrani<sup>2,3</sup>, Abdulhakeem S. Alamri<sup>2,3</sup>, Ibrahim M. El-Deen<sup>4</sup>, and Moamen S. Refat<sup>5,\*</sup>

- <sup>1</sup> Department of Biology, College of Science, Taif University, P.O. Box 11099, Taif 21944, Saudi Arabia; [a.gaber@tu.edu.sa](mailto:a.gaber@tu.edu.sa) (A.G.)
  - <sup>2</sup> Center of Biomedical Sciences Research (CBSR), Taif University, P.O. Box 11099, Taif 21944, Saudi Arabia; [a.gaber@tu.edu.sa](mailto:a.gaber@tu.edu.sa) (A.G.); [w.alsanie@tu.edu.sa](mailto:w.alsanie@tu.edu.sa) (W.F.A.); [m.alhomrani@tu.edu.sa](mailto:m.alhomrani@tu.edu.sa) (M.A.); [a.alamri@tu.edu.sa](mailto:a.alamri@tu.edu.sa) (A.S.A.)
  - <sup>3</sup> Department of Clinical Laboratories Sciences, The Faculty of Applied Medical Sciences, Taif University, P.O. Box 11099, Taif 21944, Saudi Arabia; [w.alsanie@tu.edu.sa](mailto:w.alsanie@tu.edu.sa) (W.F.A.); [m.alhomrani@tu.edu.sa](mailto:m.alhomrani@tu.edu.sa) (M.A.); [a.alamri@tu.edu.sa](mailto:a.alamri@tu.edu.sa) (A.S.A.)
  - <sup>4</sup> Department of Chemistry, Faculty of Science, Port Said University, Port Said 42511, Egypt; [ildeen@yahoo.com](mailto:ildeen@yahoo.com) (I.M.E)
  - <sup>5</sup> Department of Chemistry, College of Science, Taif University, P.O. Box 11099, Taif 21944, Saudi Arabia; [moamen@tu.edu.sa](mailto:moamen@tu.edu.sa) (M.S.R.)
- \* Correspondence: [moamen@tu.edu.sa](mailto:moamen@tu.edu.sa)

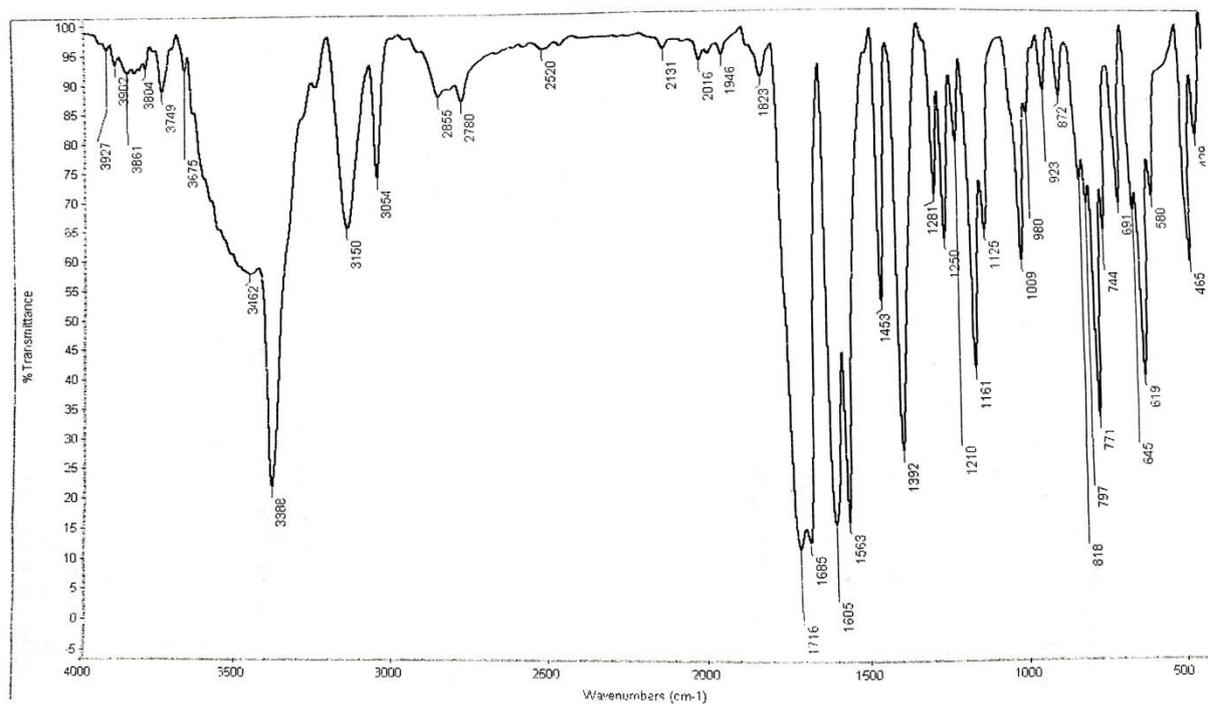


Figure S1: FT-IR spectrum of compound (3)

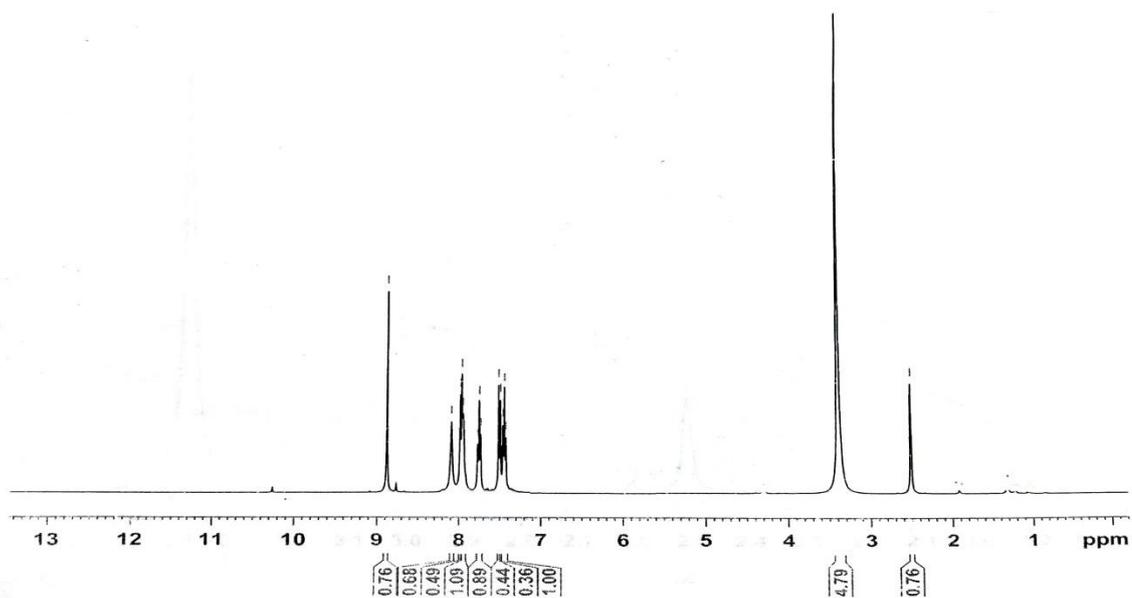


Figure S2: <sup>1</sup>H-NMR spectrum of compound (3)

23

24

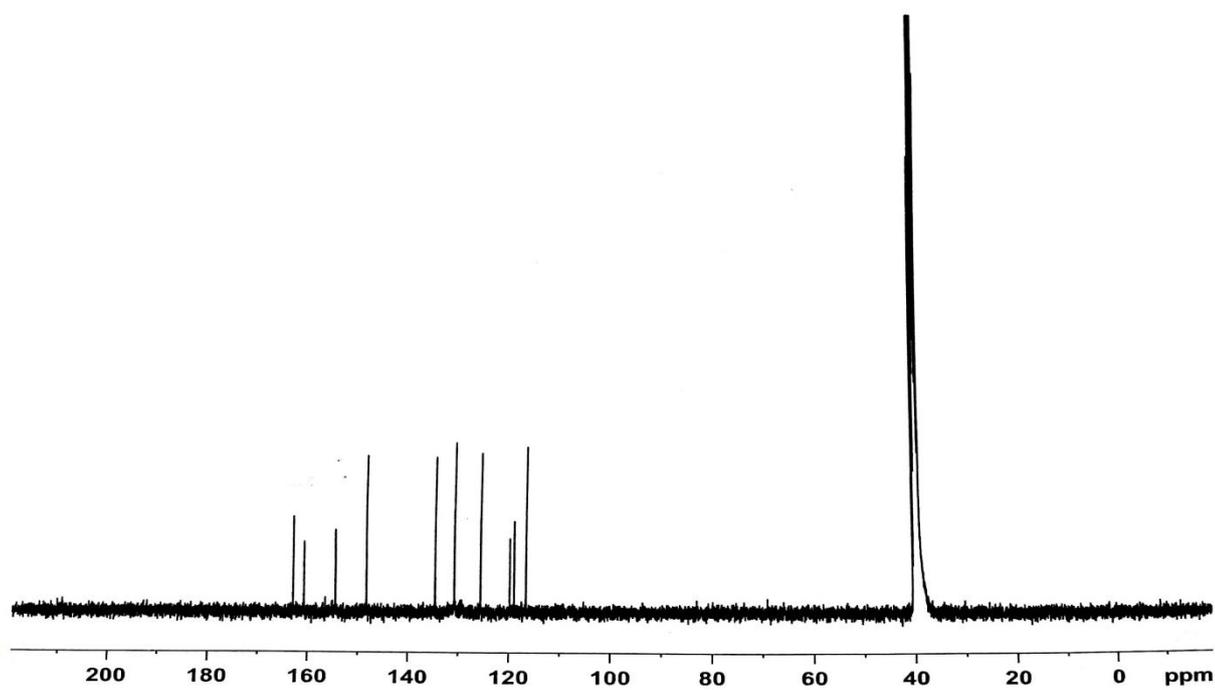


Figure S3: <sup>13</sup>C-NMR spectrum of compound (3)

25

26

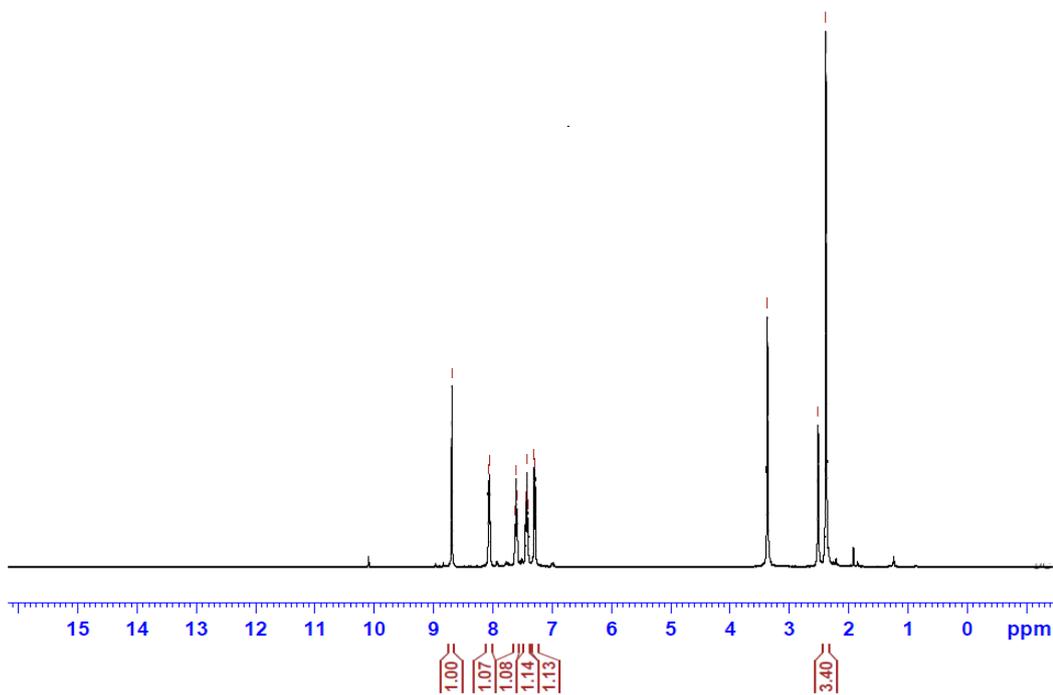


Figure S4:  $^1\text{H-NMR}$  spectrum of compound (4)

27

28

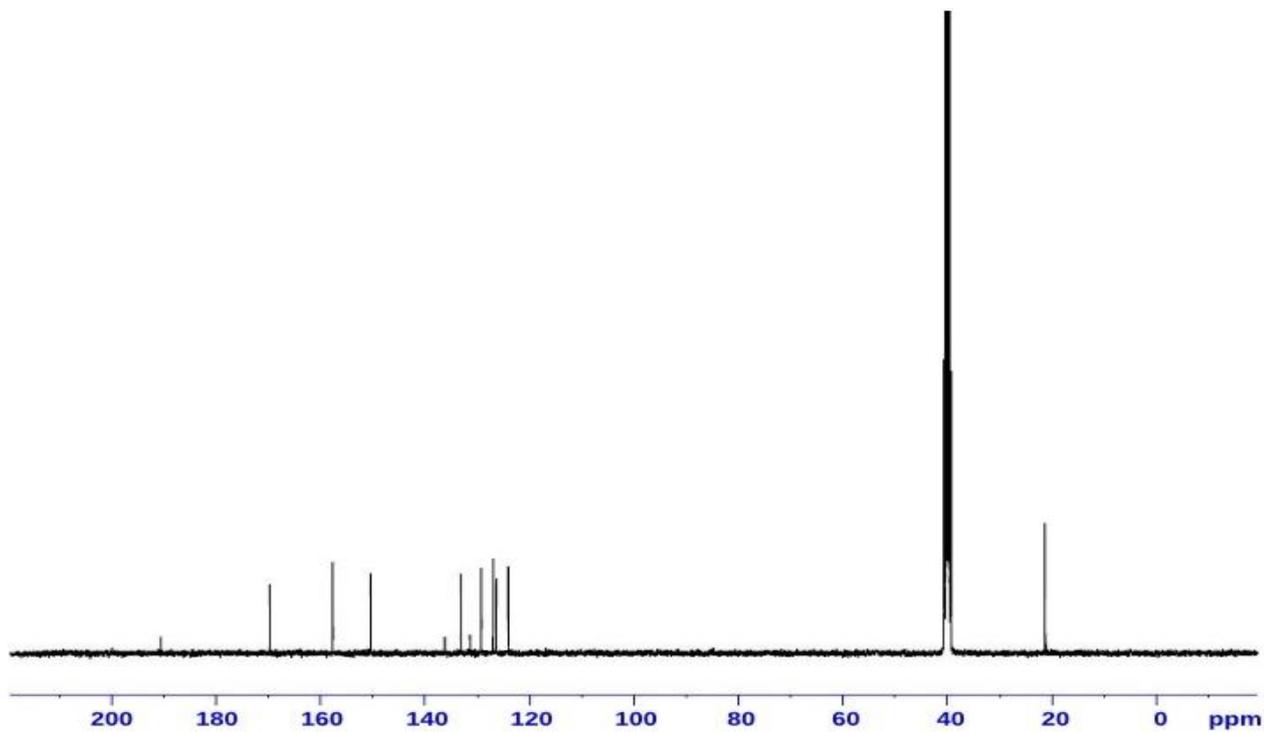


Figure S5:  $^{13}\text{C-NMR}$  spectrum of compound (4)

29

30

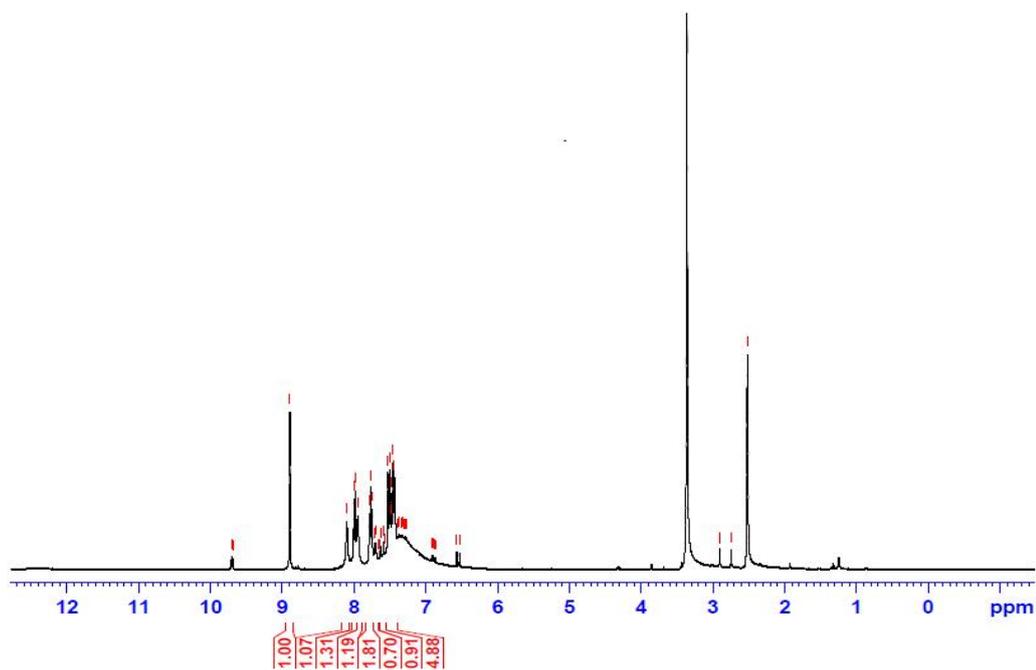


Figure S6: <sup>1</sup>H-NMR spectrum of compound (5)

31

32

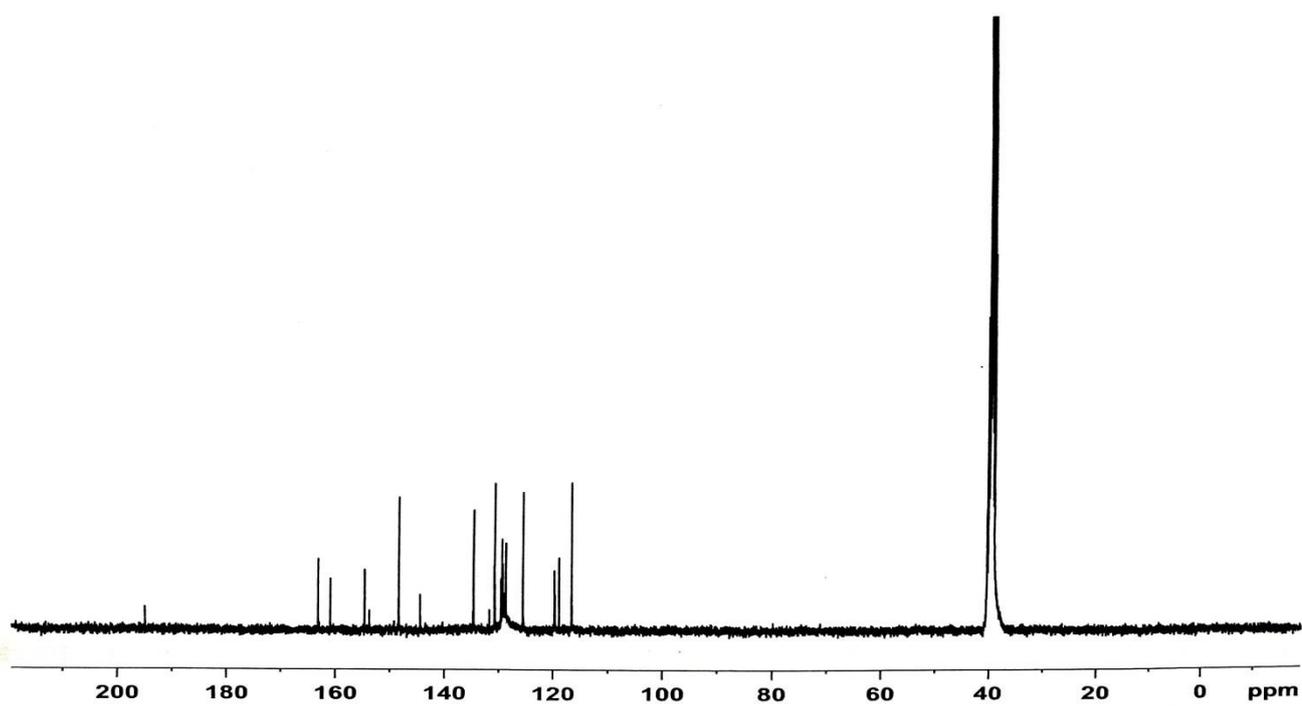


Figure S7: <sup>13</sup>C-NMR spectrum of compound (5)

33

34

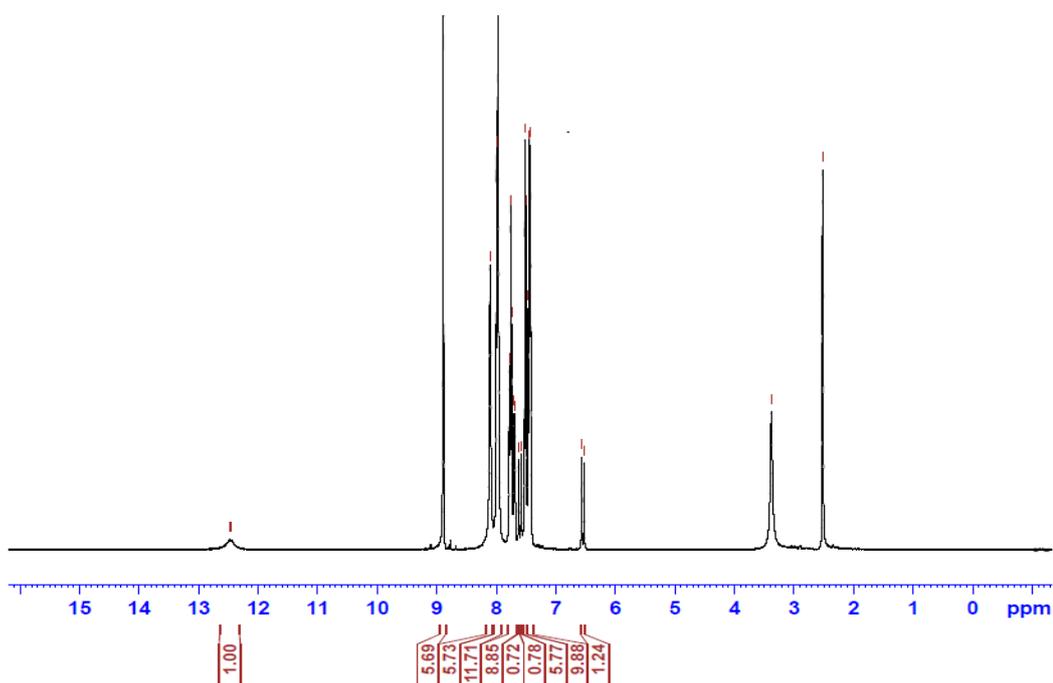


Figure S8: <sup>1</sup>H-NMR spectrum of compound (6)

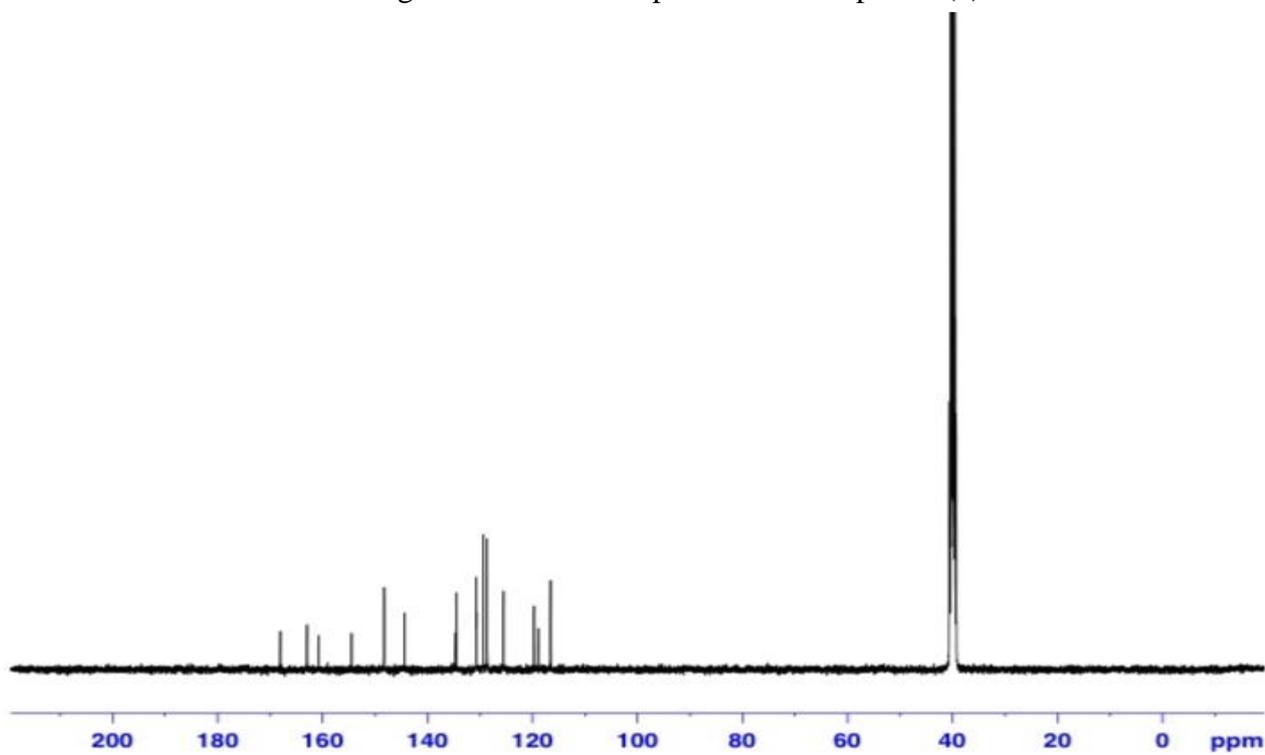


Figure S9: <sup>13</sup>C-NMR spectrum of compound (6)

35

36

37

38

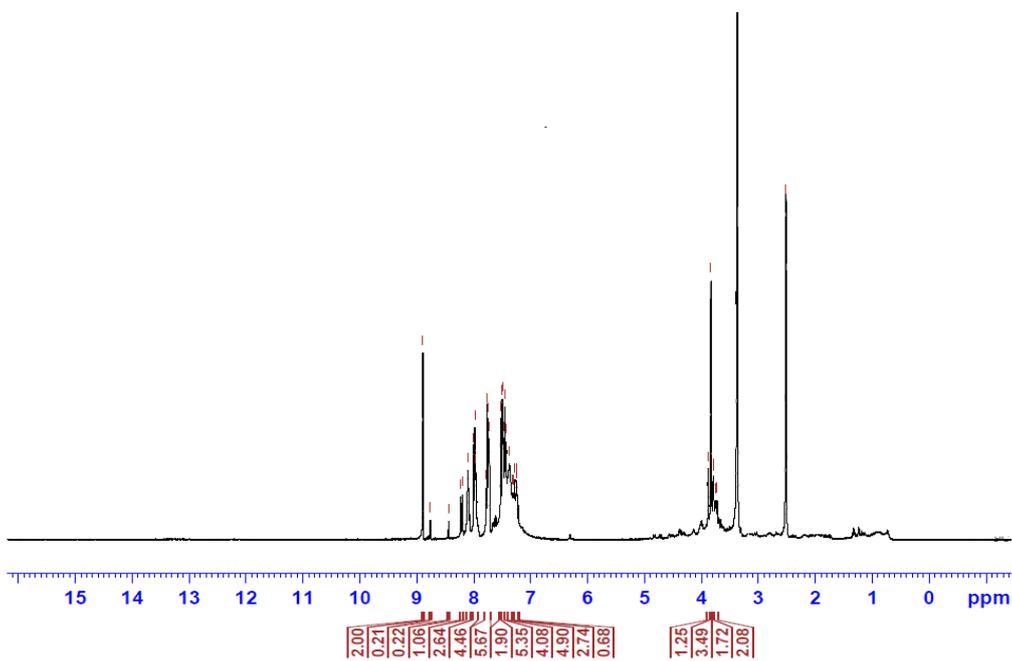


Figure S10: <sup>1</sup>H-NMR spectrum of compound (9)

39

40

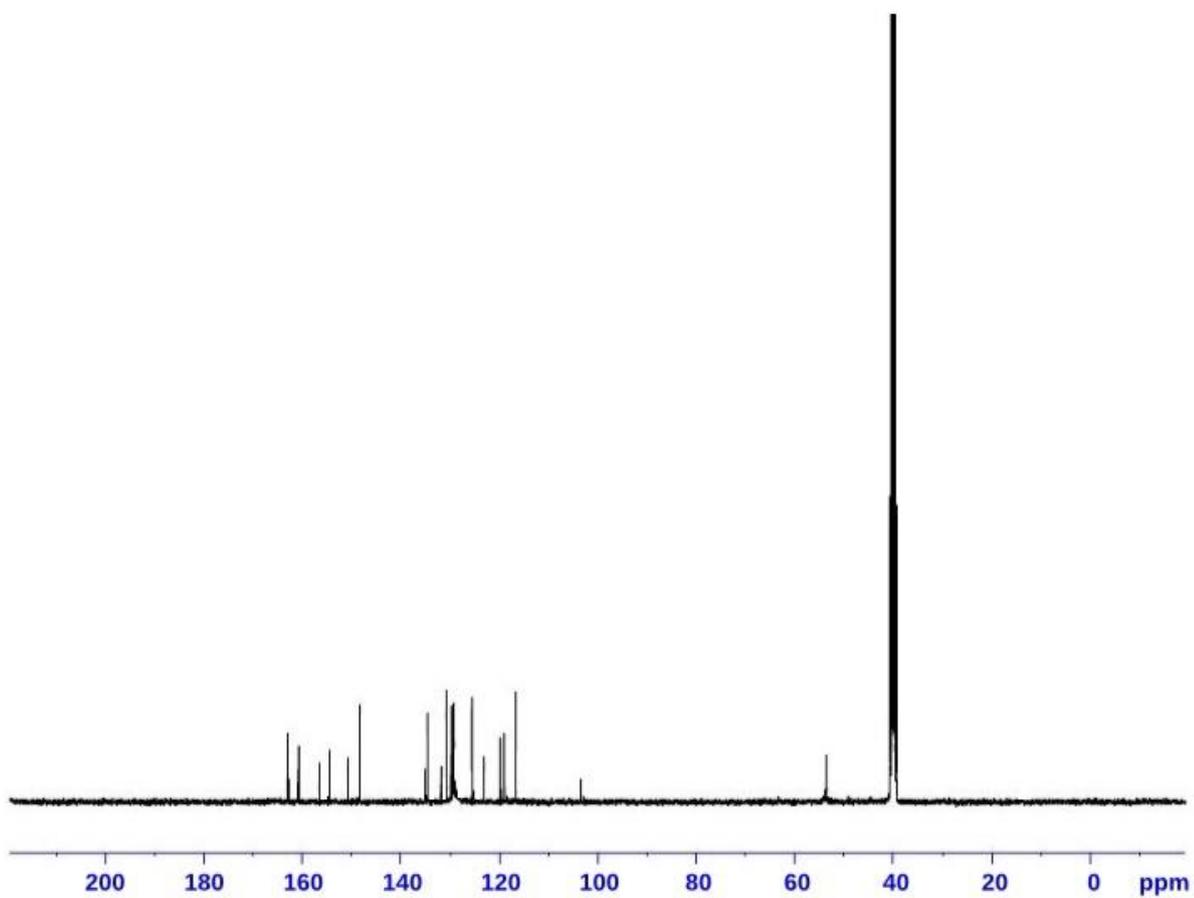


Figure S11: <sup>13</sup>C-NMR spectrum of compound (9)

41

42

43

44