

圖 17-1 MS spectrum of compound 17

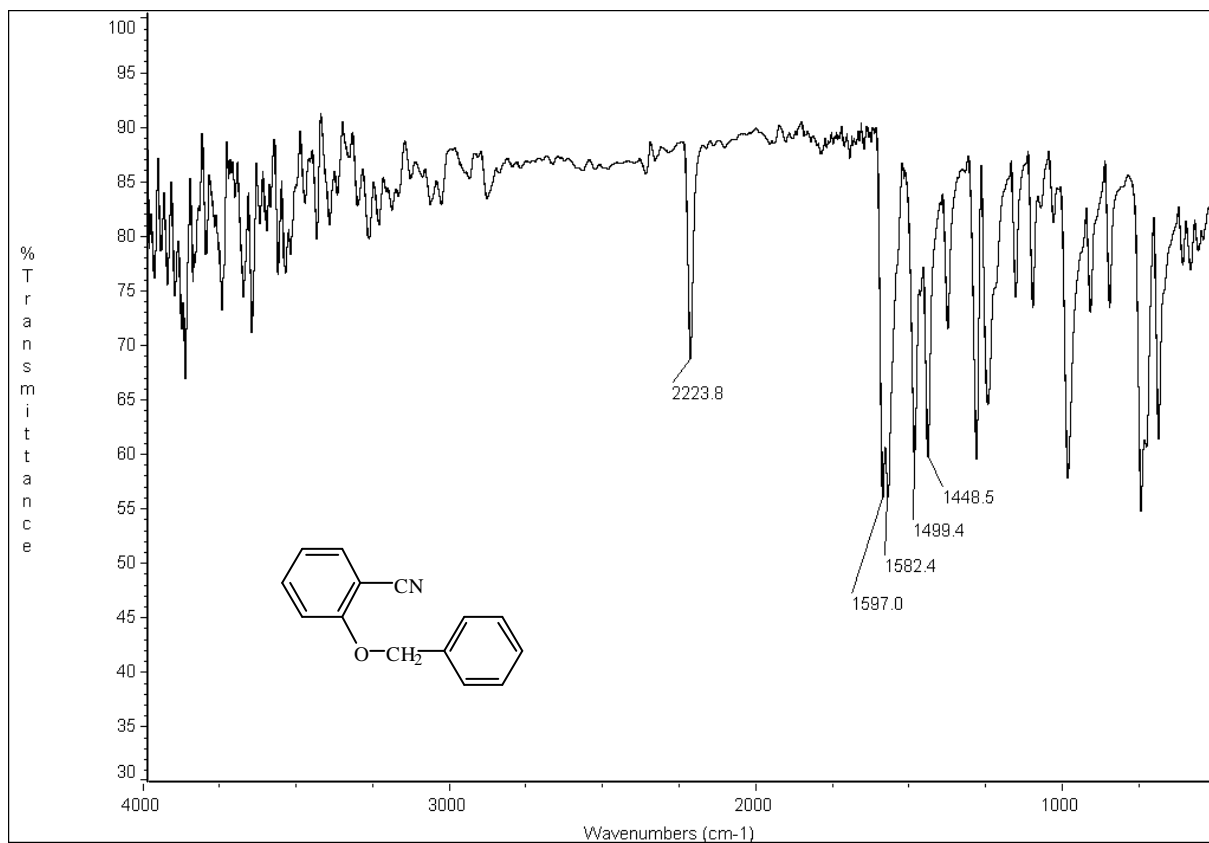


圖 17-2 IR (KBr) spectrum of compound 17

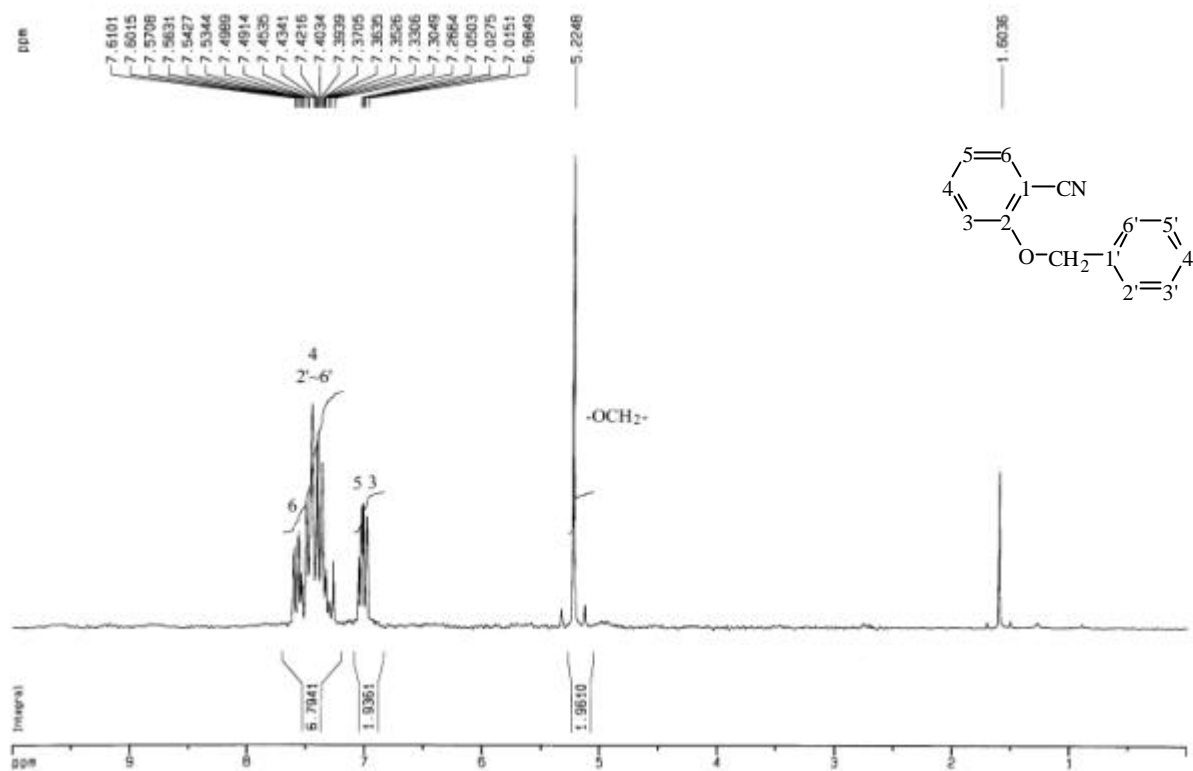


圖 17-3  $^1\text{H-NMR}$  (CDCl<sub>3</sub>, 200 MHz) spectrum of compound 17

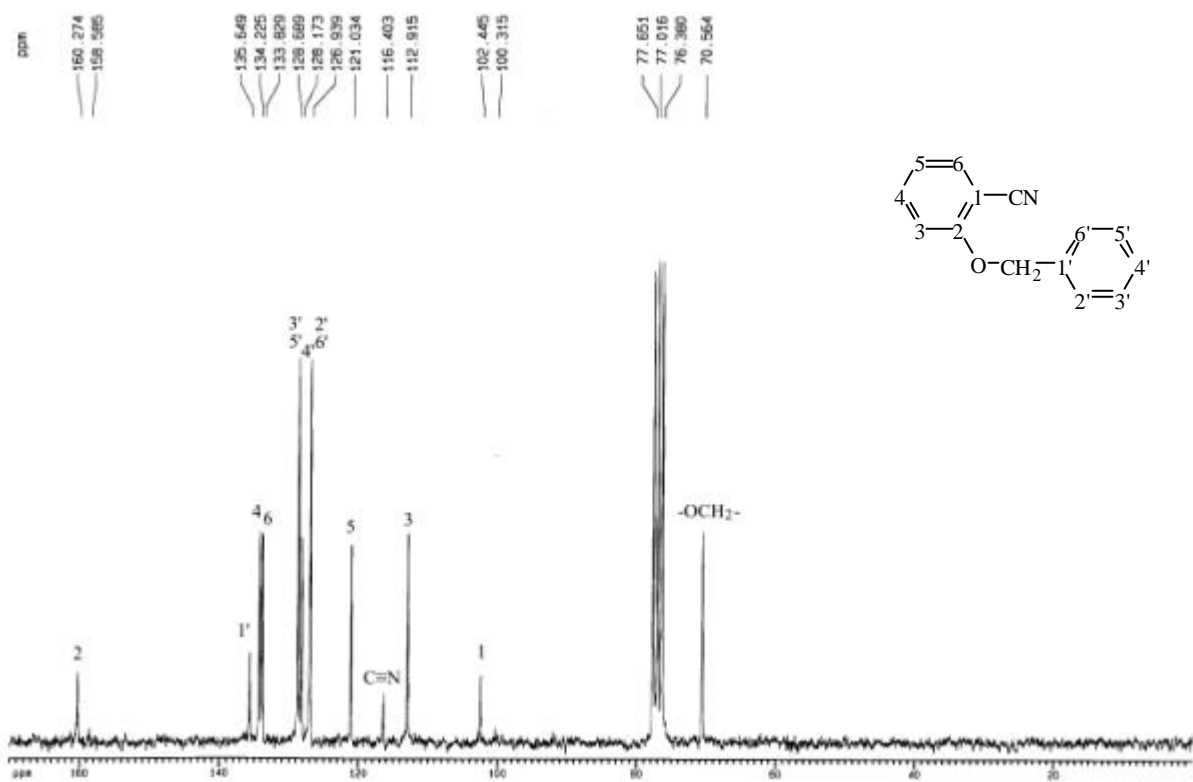


圖 17-4  $^{13}\text{C-NMR}$  (CDCl<sub>3</sub>, 50 MHz) spectrum of compound 17

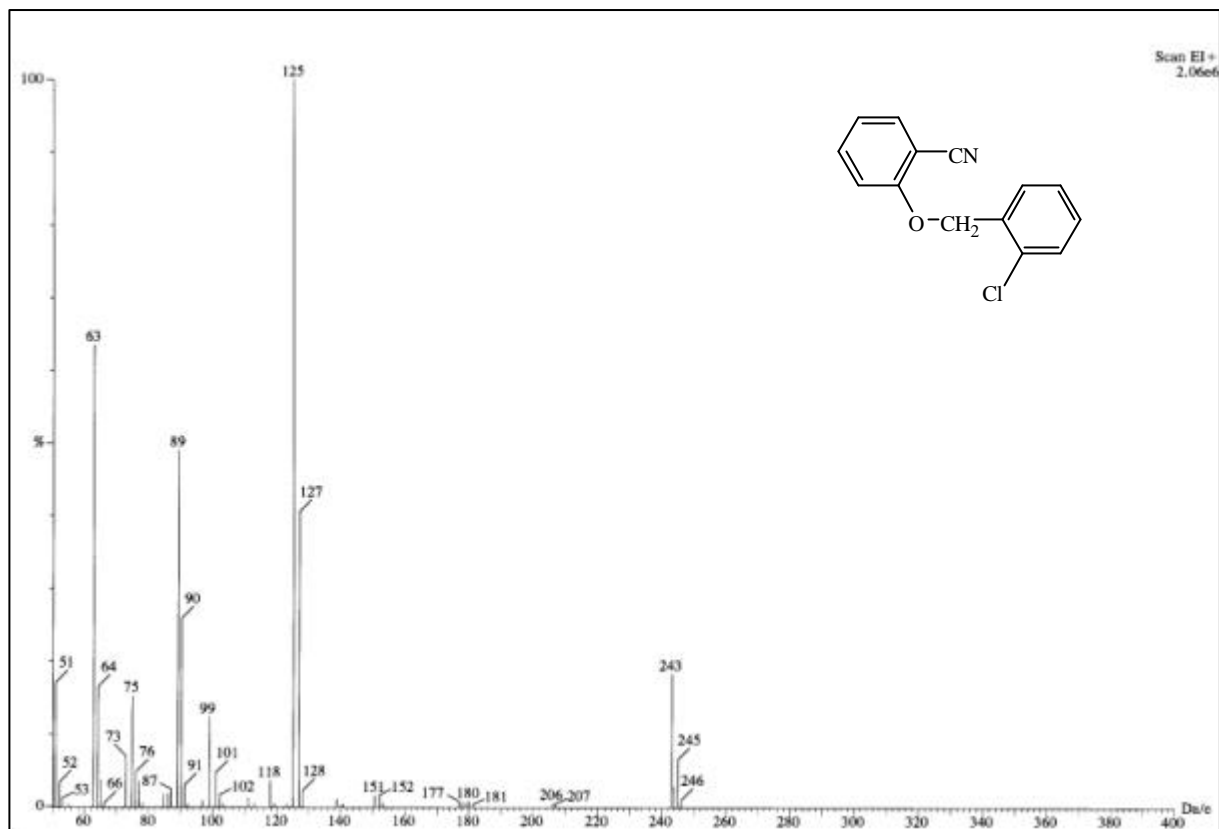


圖 18-1 MS spectrum of compound 18

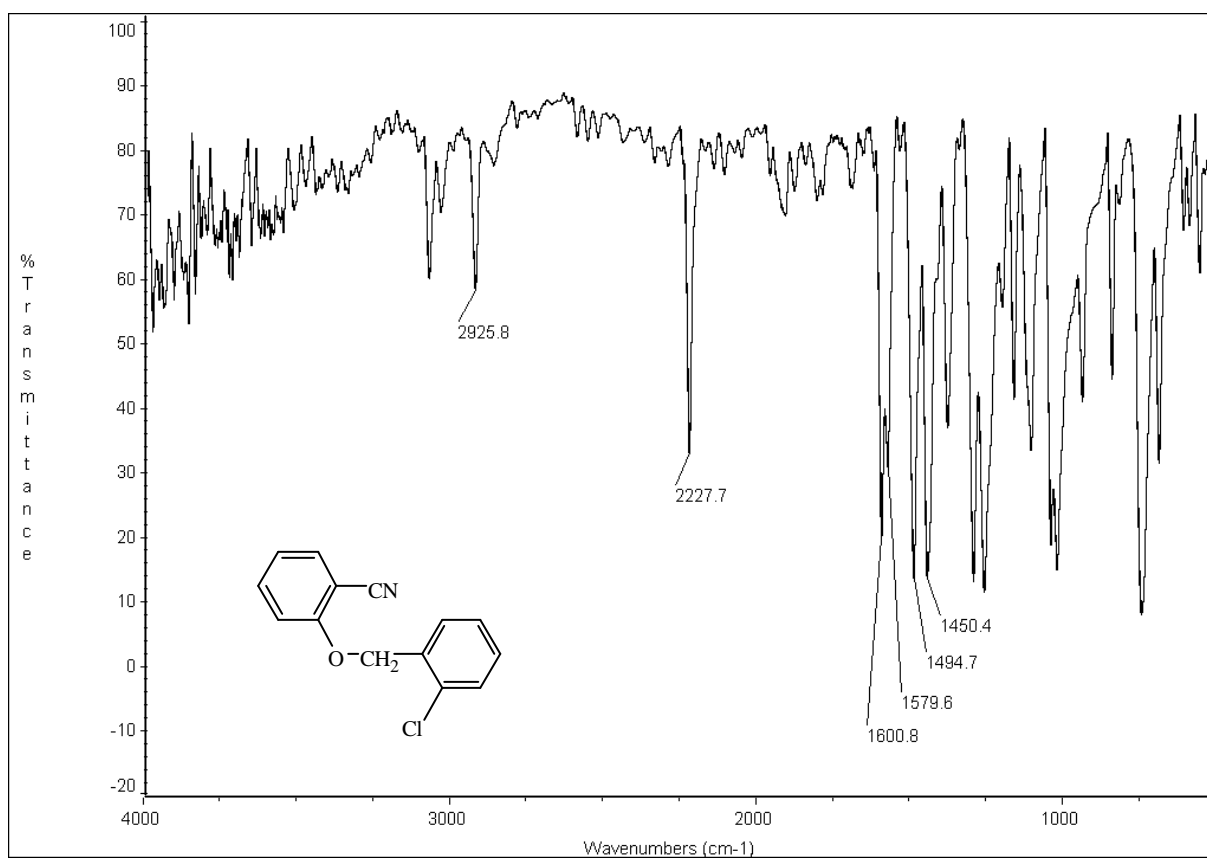


圖 18-2 IR (KBr) spectrum of compound 18

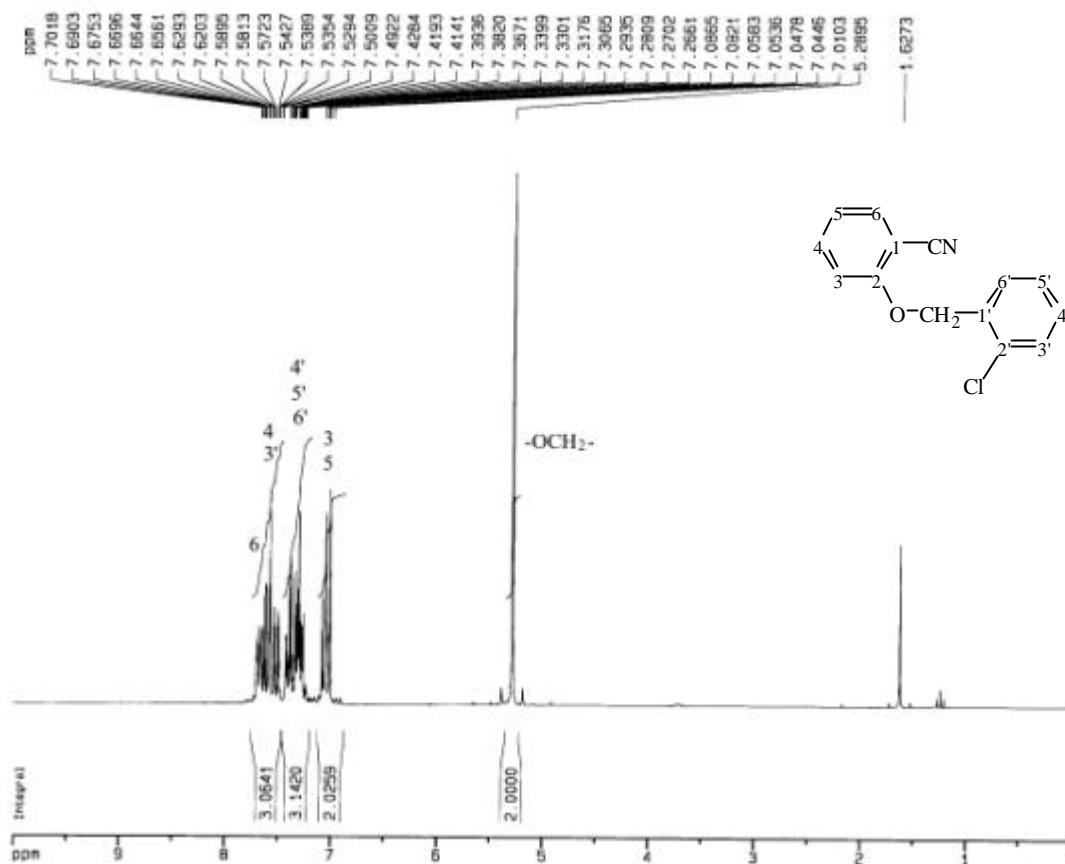


圖 18-3 <sup>1</sup>H-NMR (CDCl<sub>3</sub>, 200 MHz) spectrum of compound 18

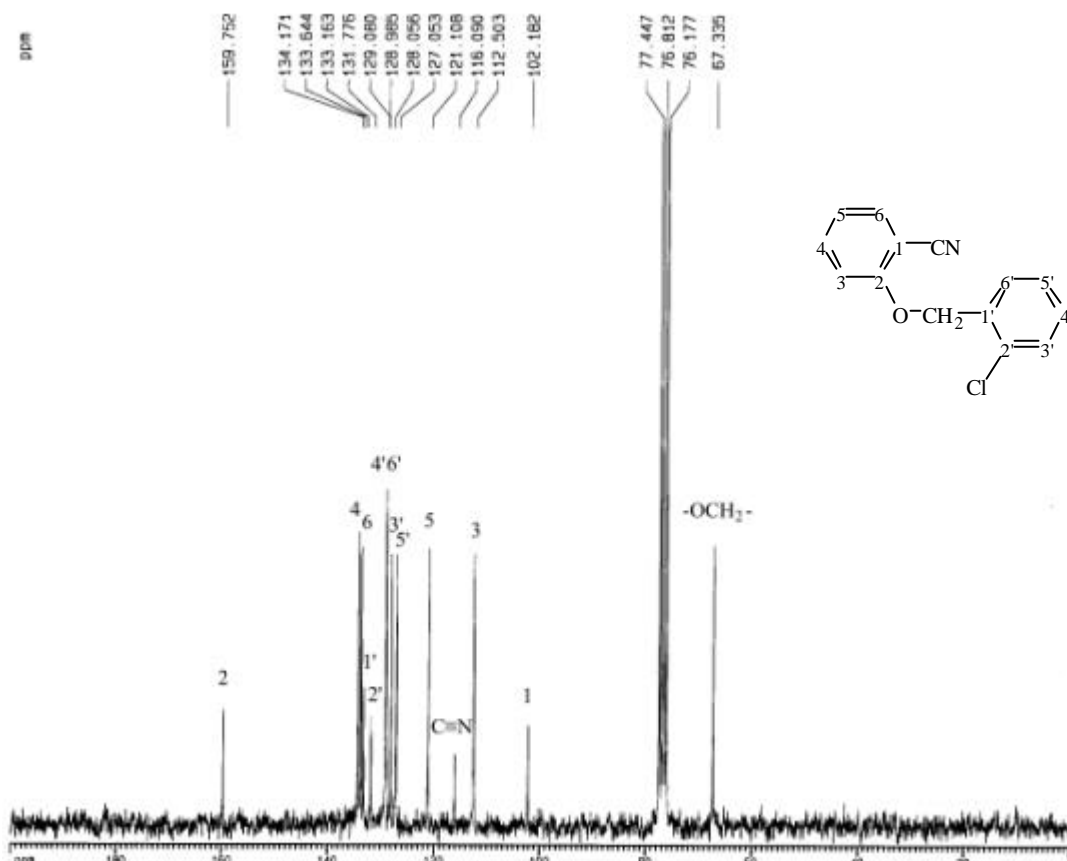


圖 18-4 <sup>13</sup>C-NMR (CDCl<sub>3</sub>, 50 MHz) spectrum of compound 18

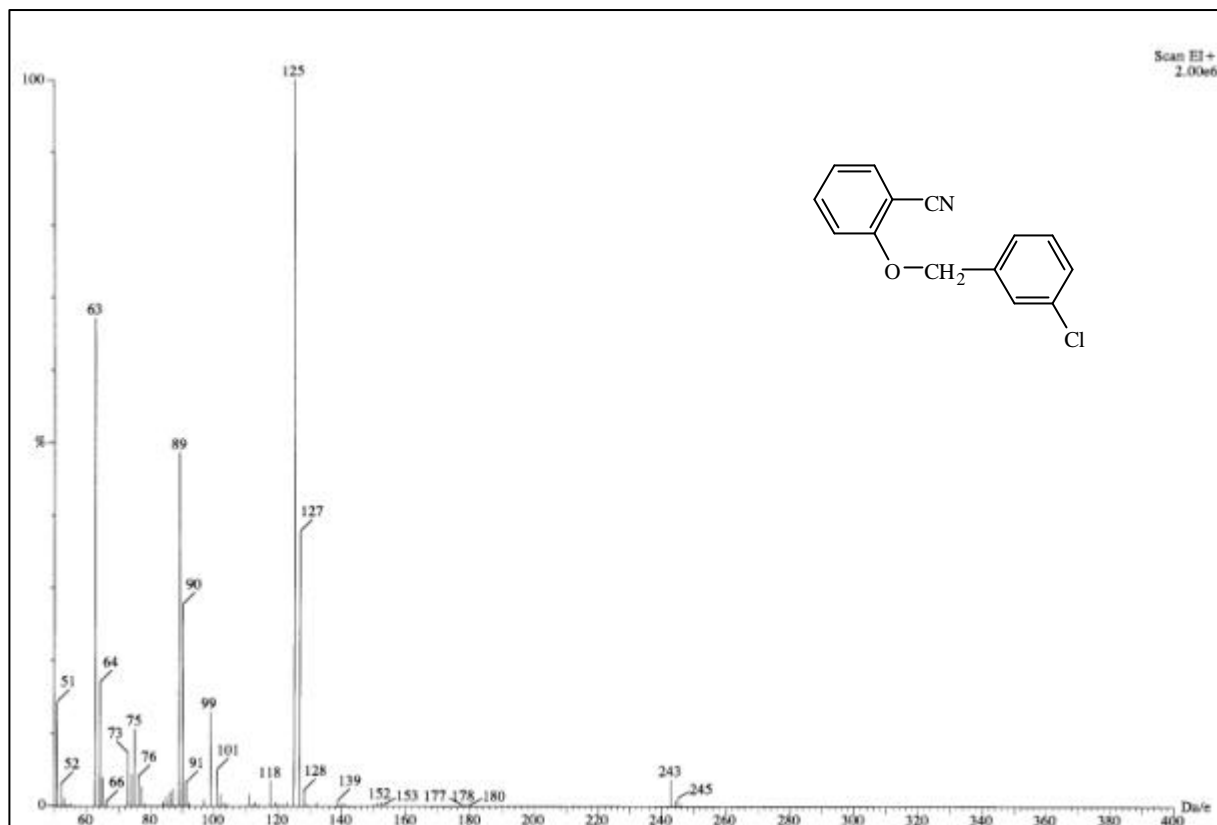


圖 19-1 MS spectrum of compound 19

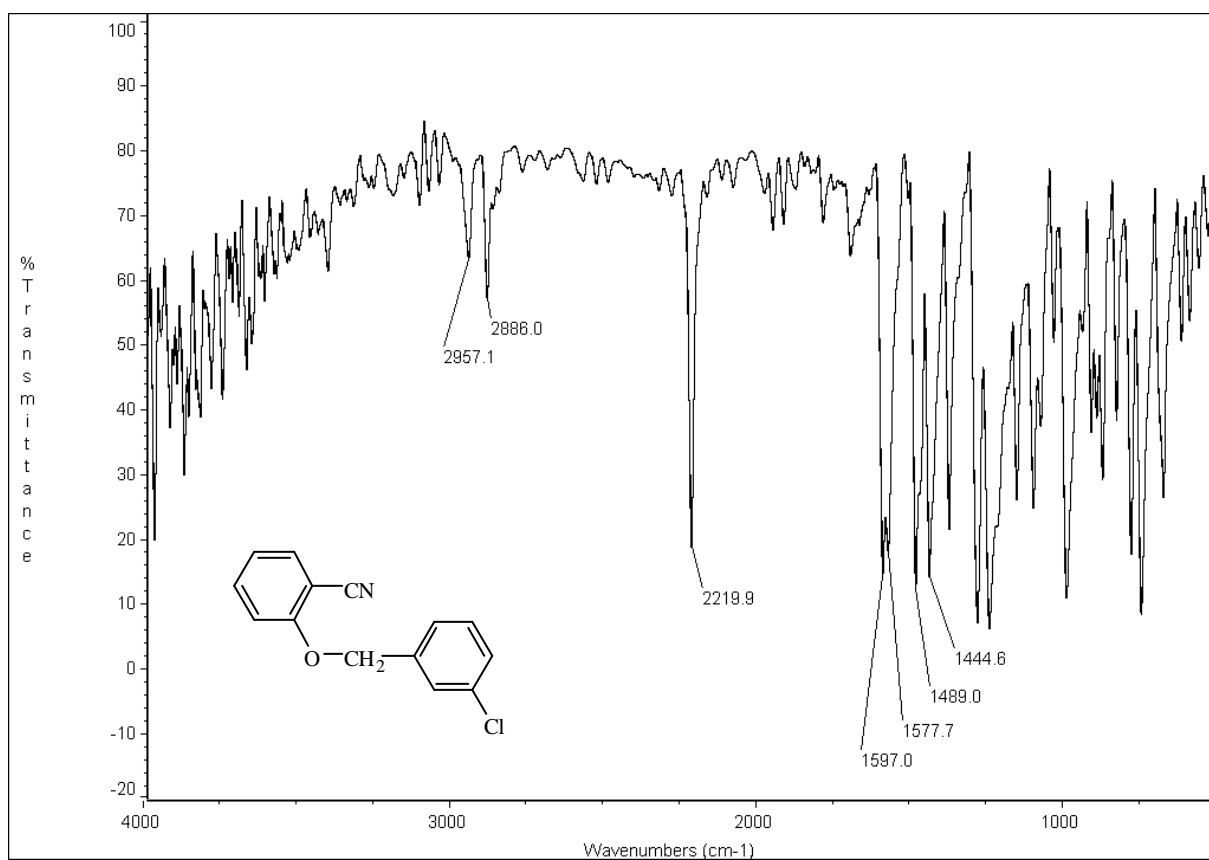


圖 19-2 IR (KBr) spectrum of compound 19

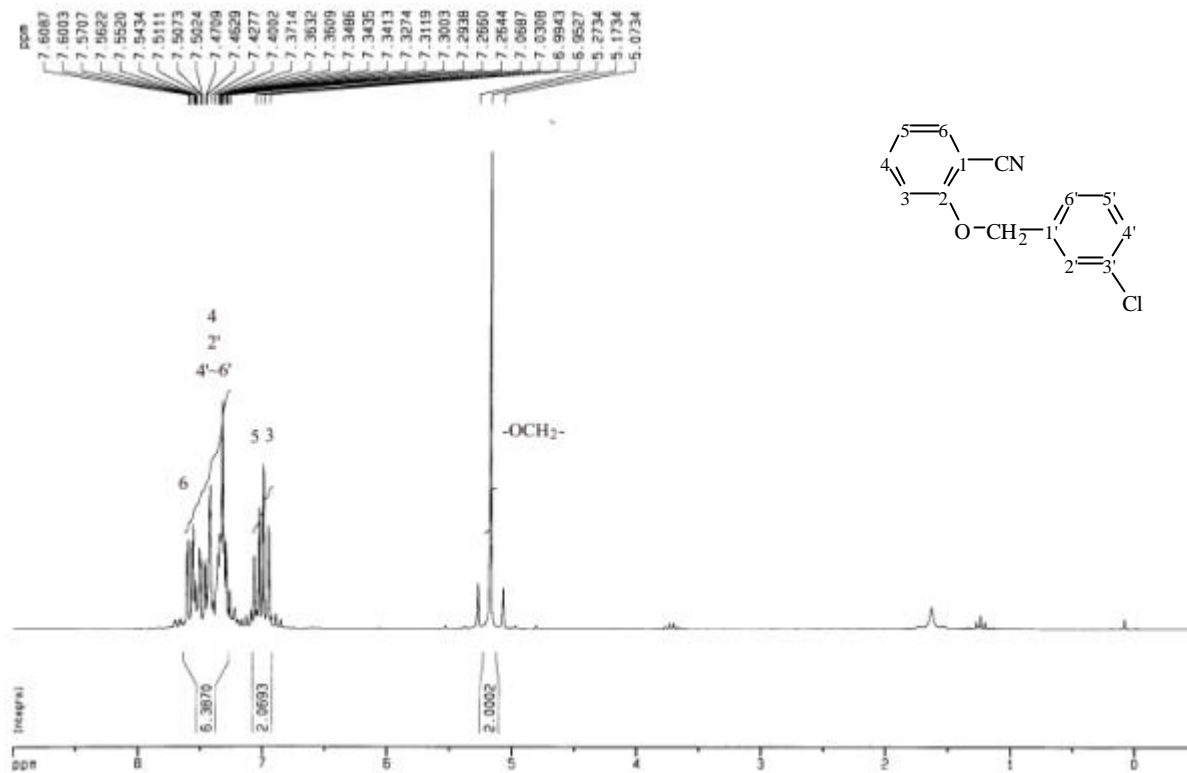


圖 19-3  $^1\text{H-NMR}$  ( $\text{CDCl}_3$ , 200 MHz) spectrum of compound **19**

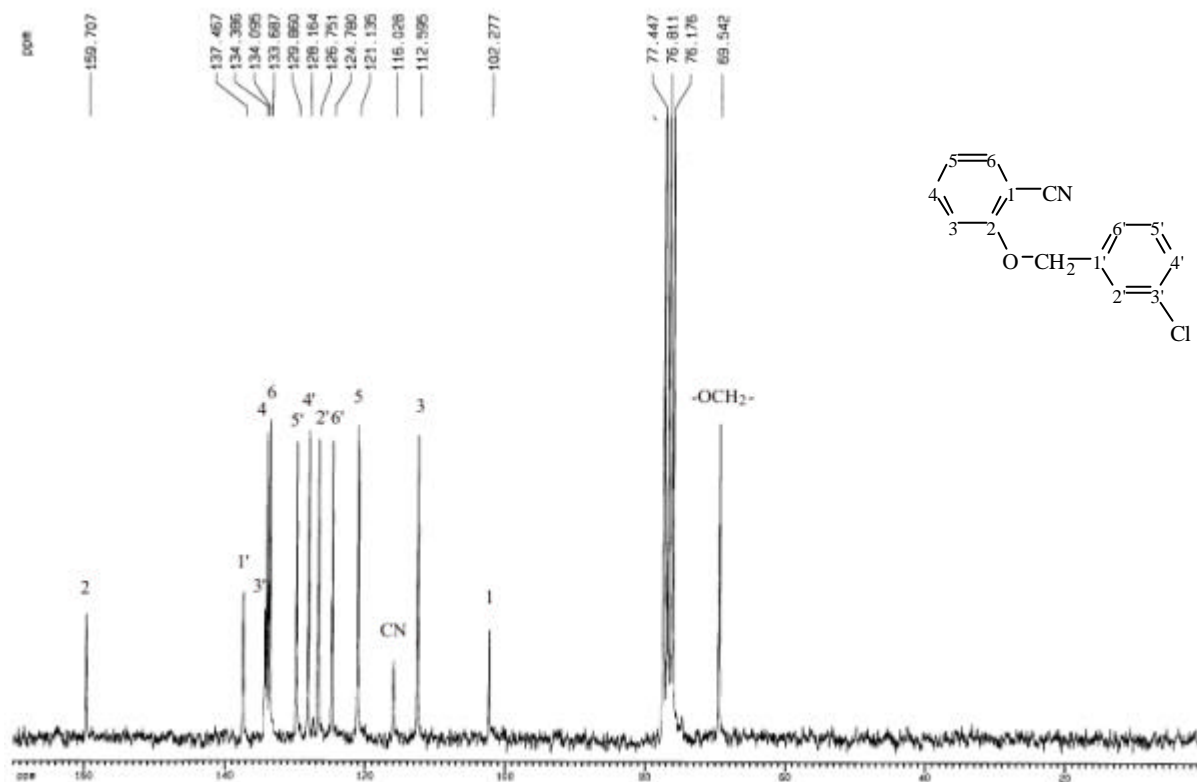


圖 19-4  $^{13}\text{C-NMR}$  ( $\text{CDCl}_3$ , 50 MHz) spectrum of compound **19**

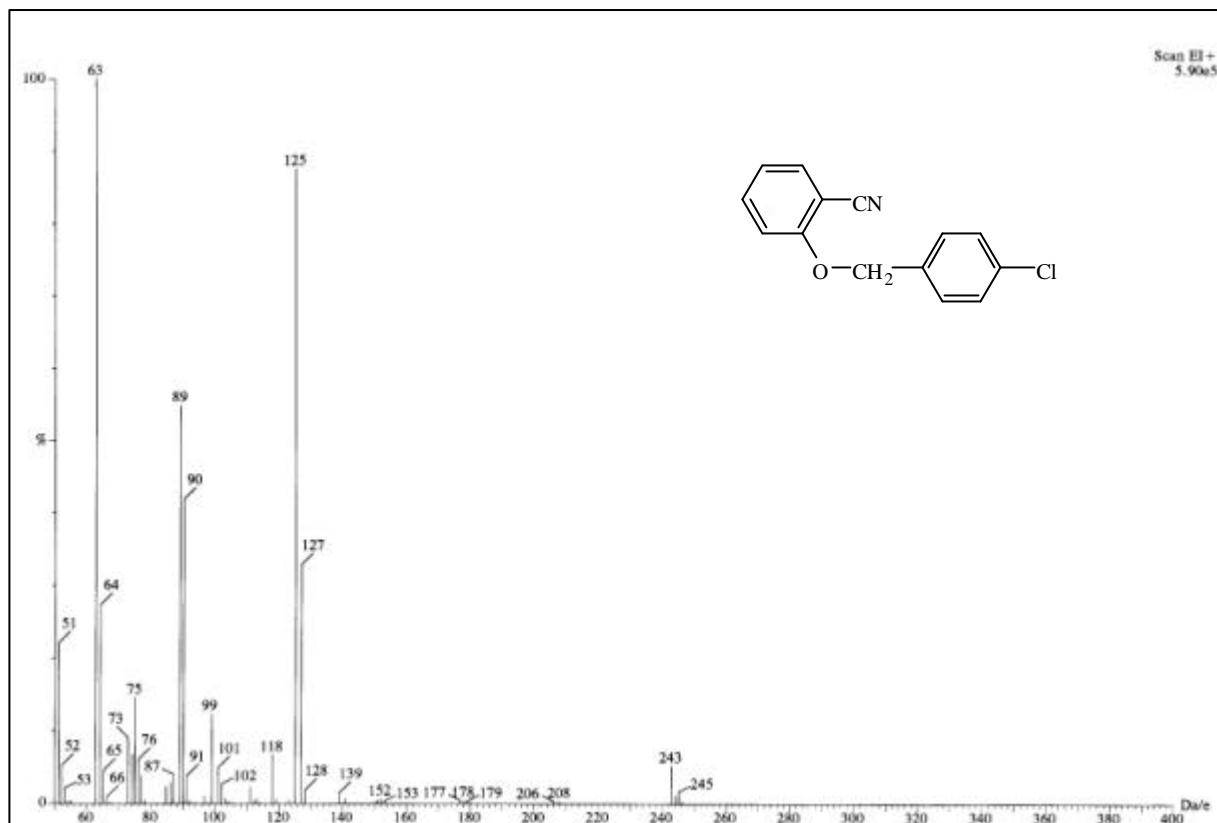


圖 20-1 MS spectrum of compound 20

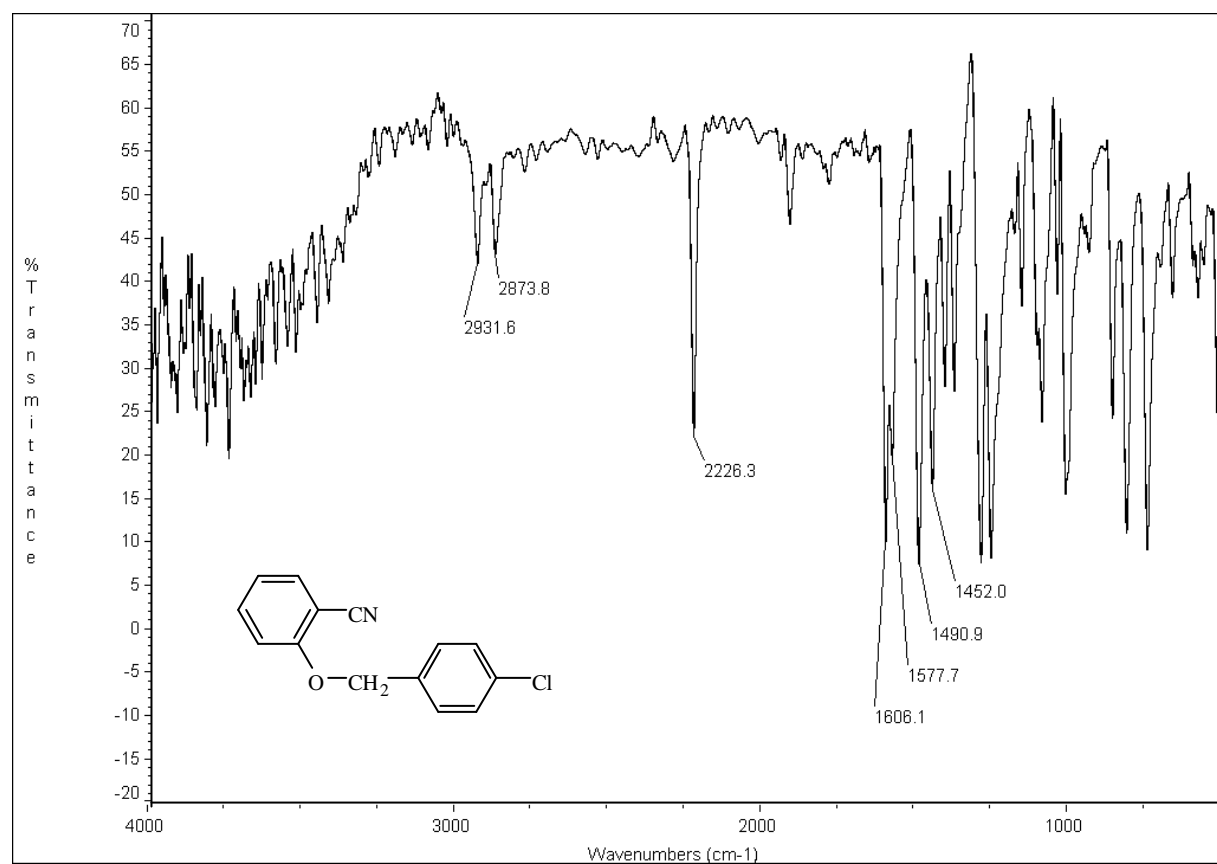


圖 20-2 IR (KBr) spectrum of compound 20

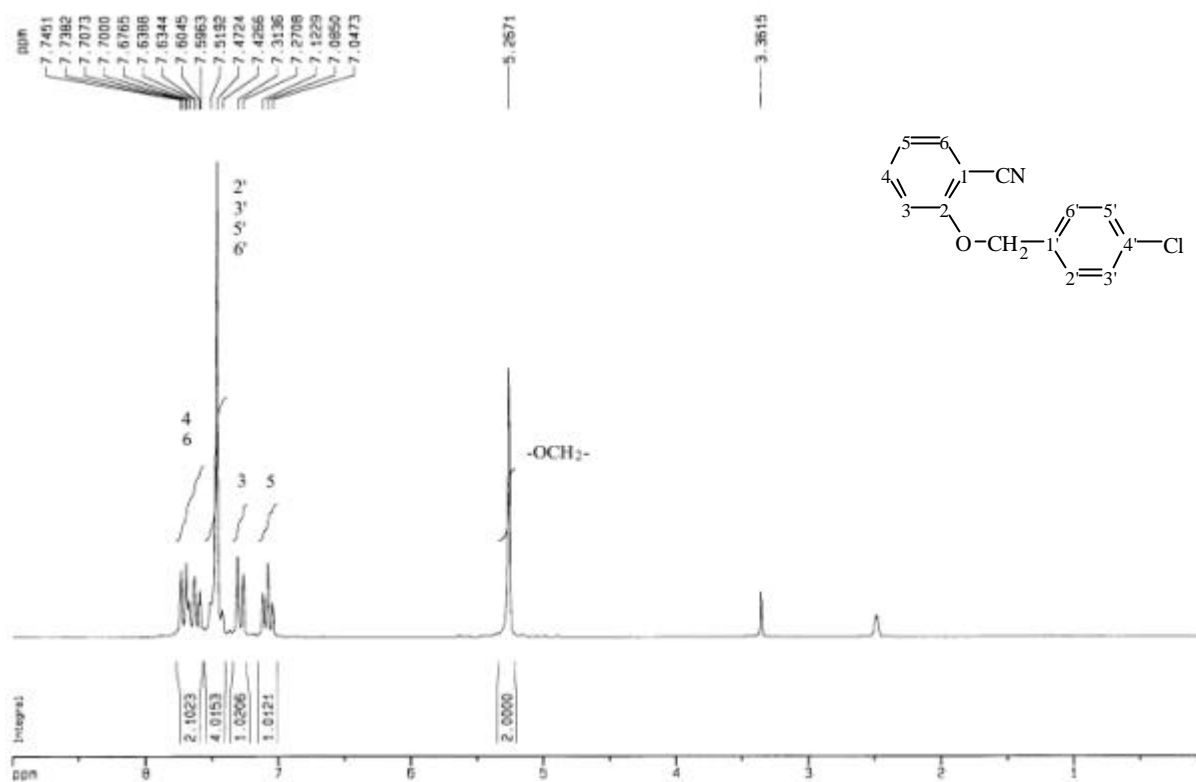


圖 20-3  $^1\text{H-NMR}$  (CDCl<sub>3</sub>, 200 MHz) spectrum of compound **20**

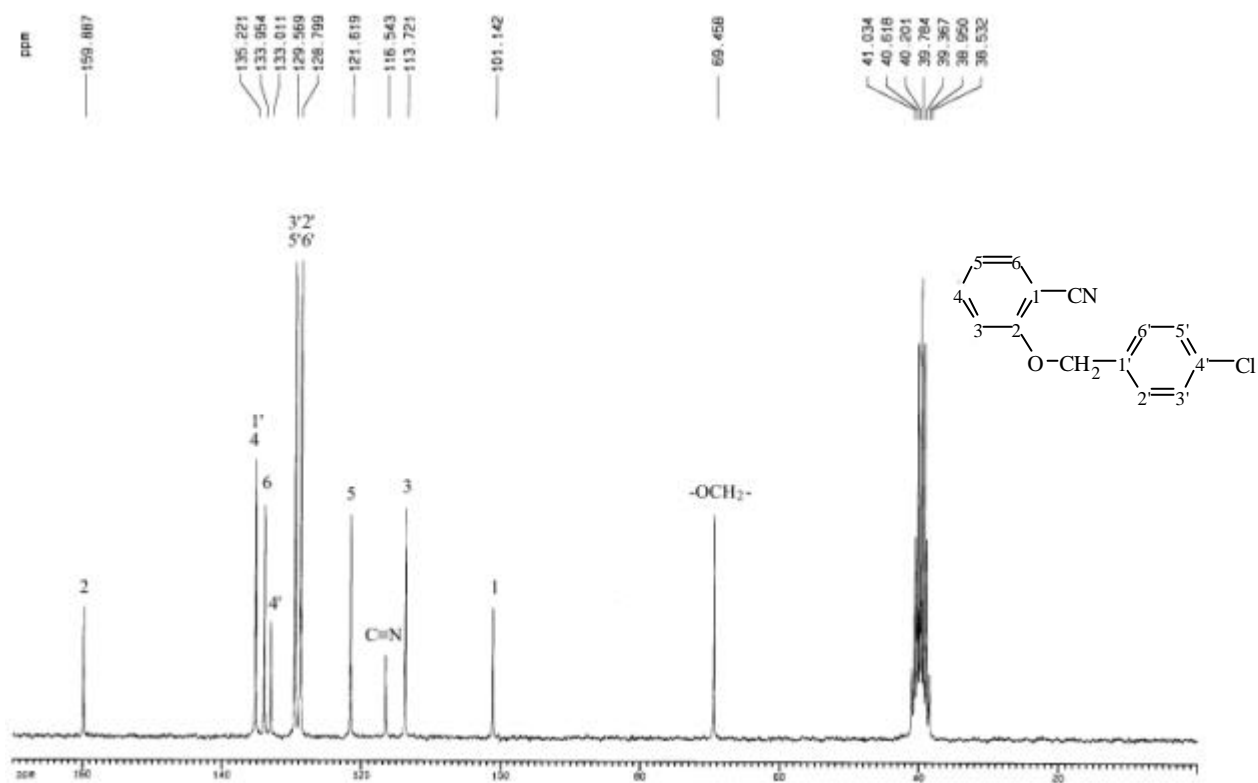


圖 20-4  $^{13}\text{C-NMR}$  (CDCl<sub>3</sub>, 50 MHz) spectrum of compound **20**



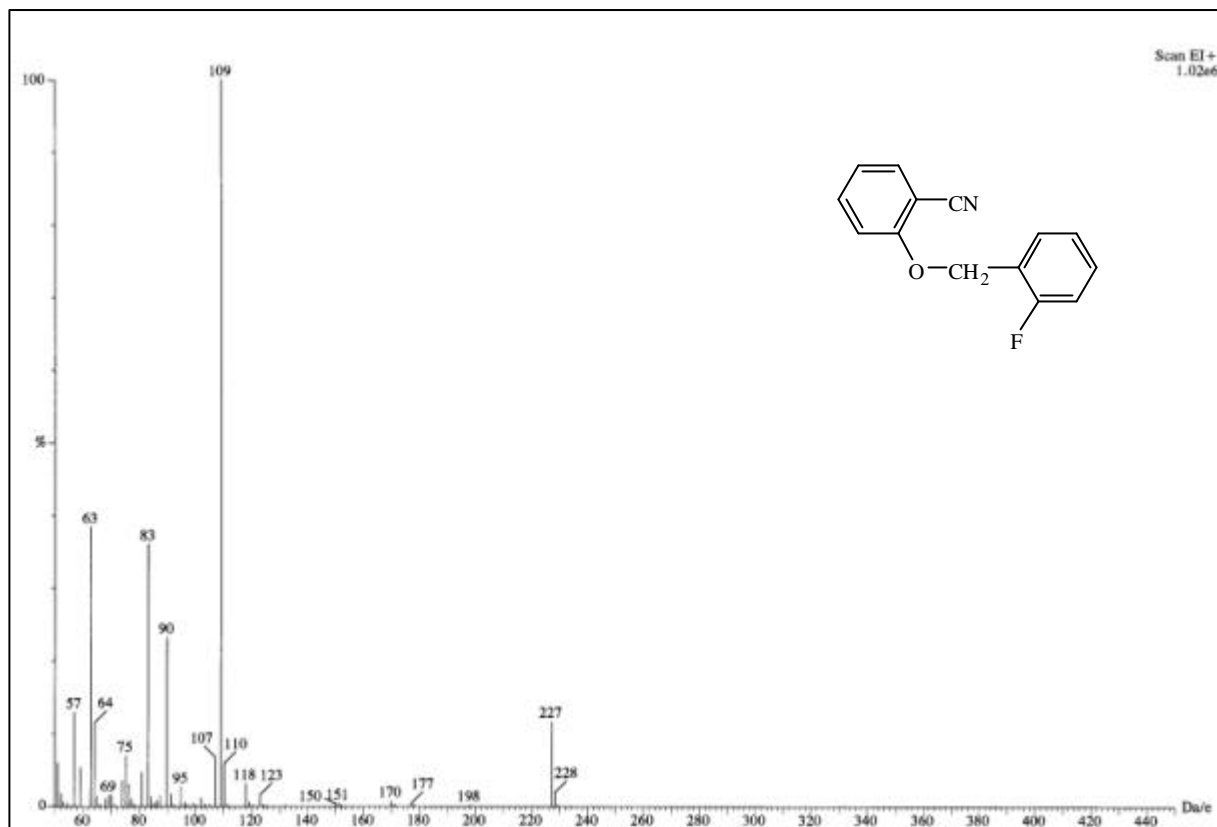


圖 21-1 MS spectrum of compound **21**

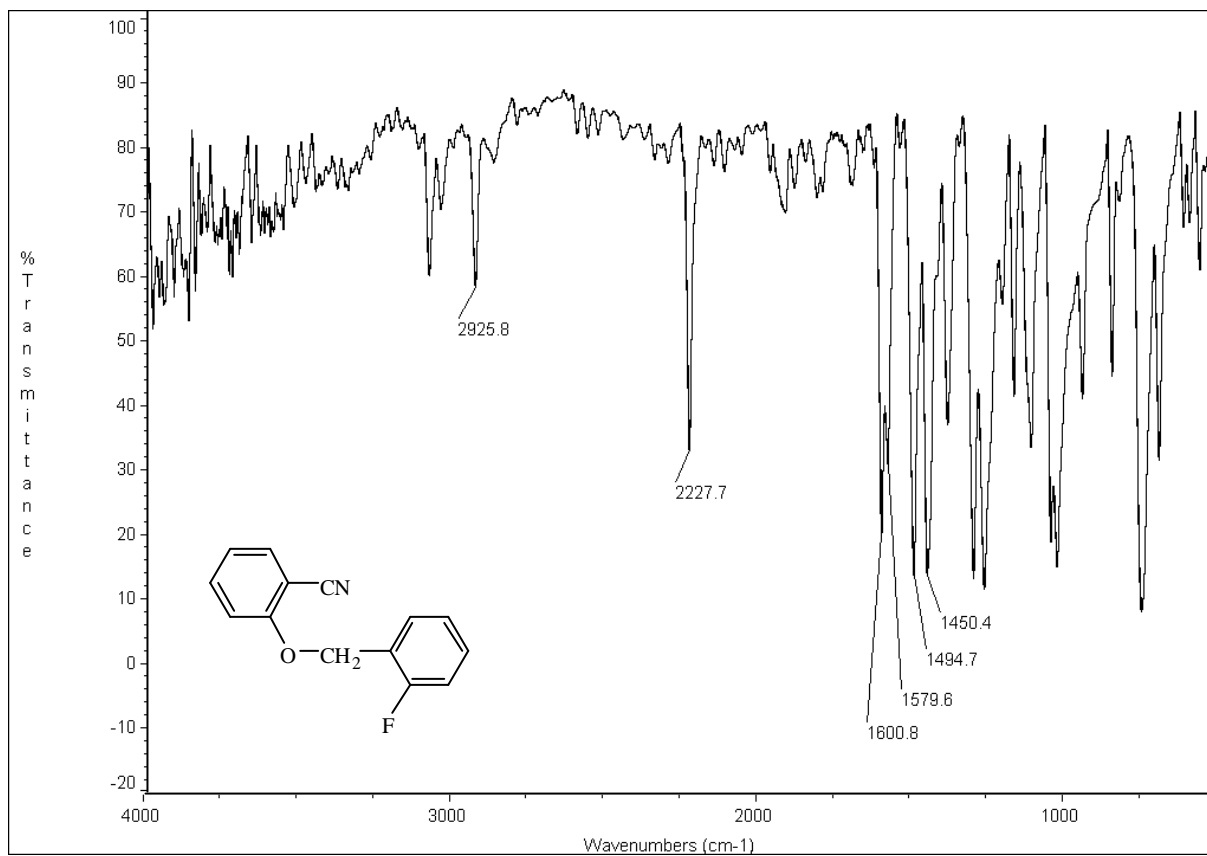


圖 21-2 IR (KBr) spectrum of compound **21**

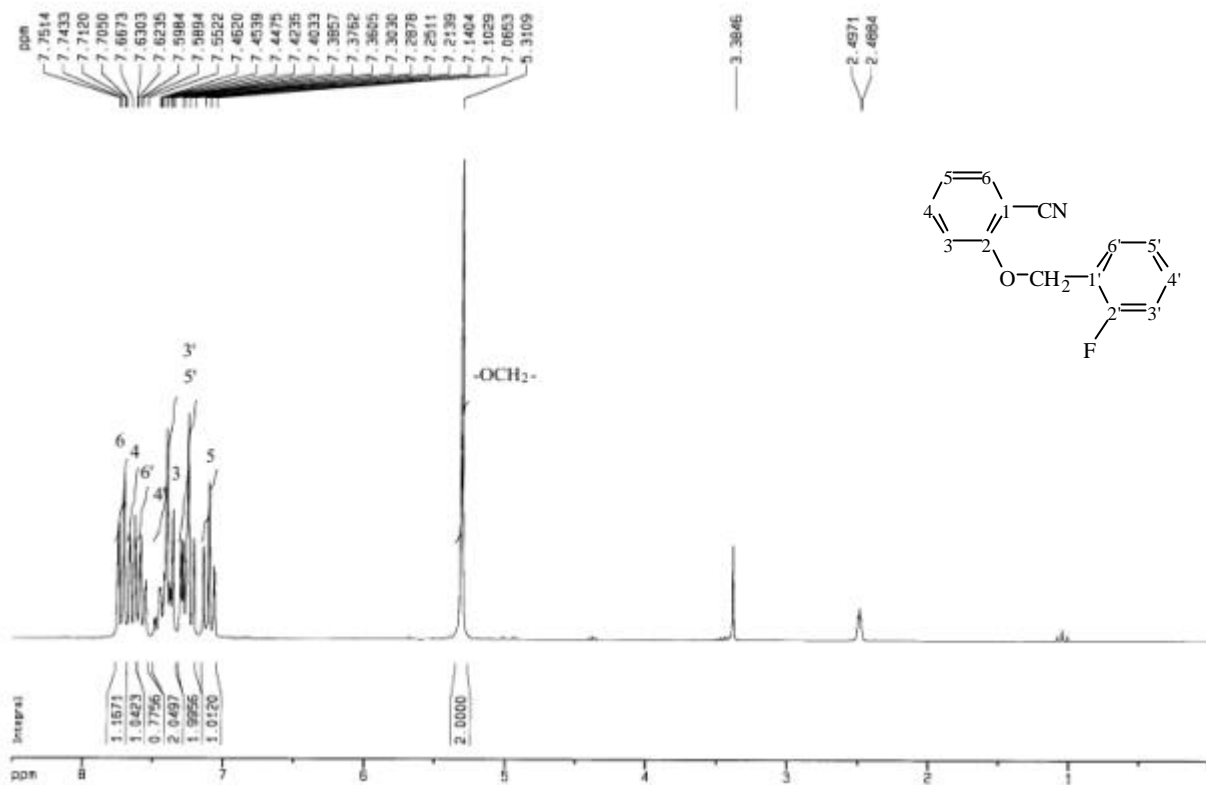


圖 21-3  $^1\text{H-NMR}$  (DMSO- $d_6$ , 200 MHz) spectrum of compound **21**

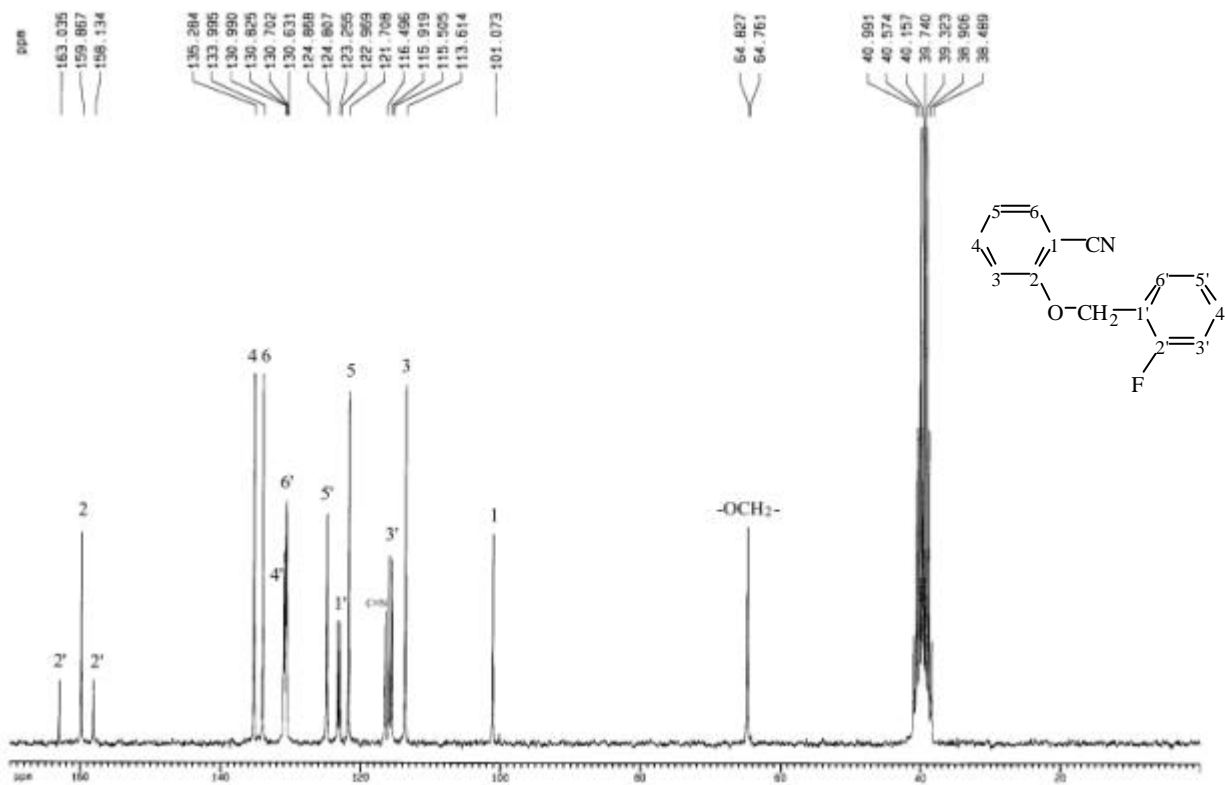


圖 21-4  $^{13}\text{C-NMR}$  (DMSO- $d_6$ , 50 MHz) spectrum of compound **21**

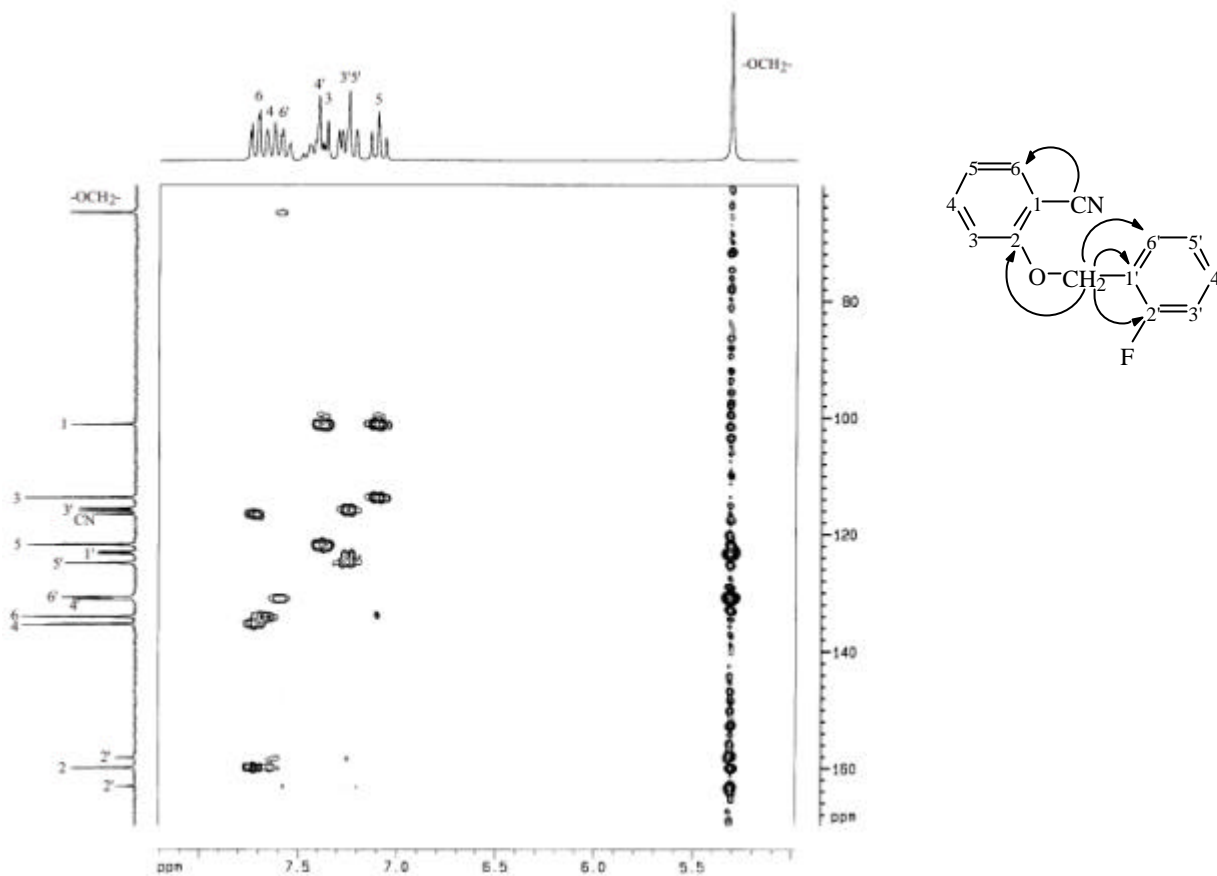


圖 21-5 HMBC (DMSO- $d_6$ ) spectrum of compound **21**

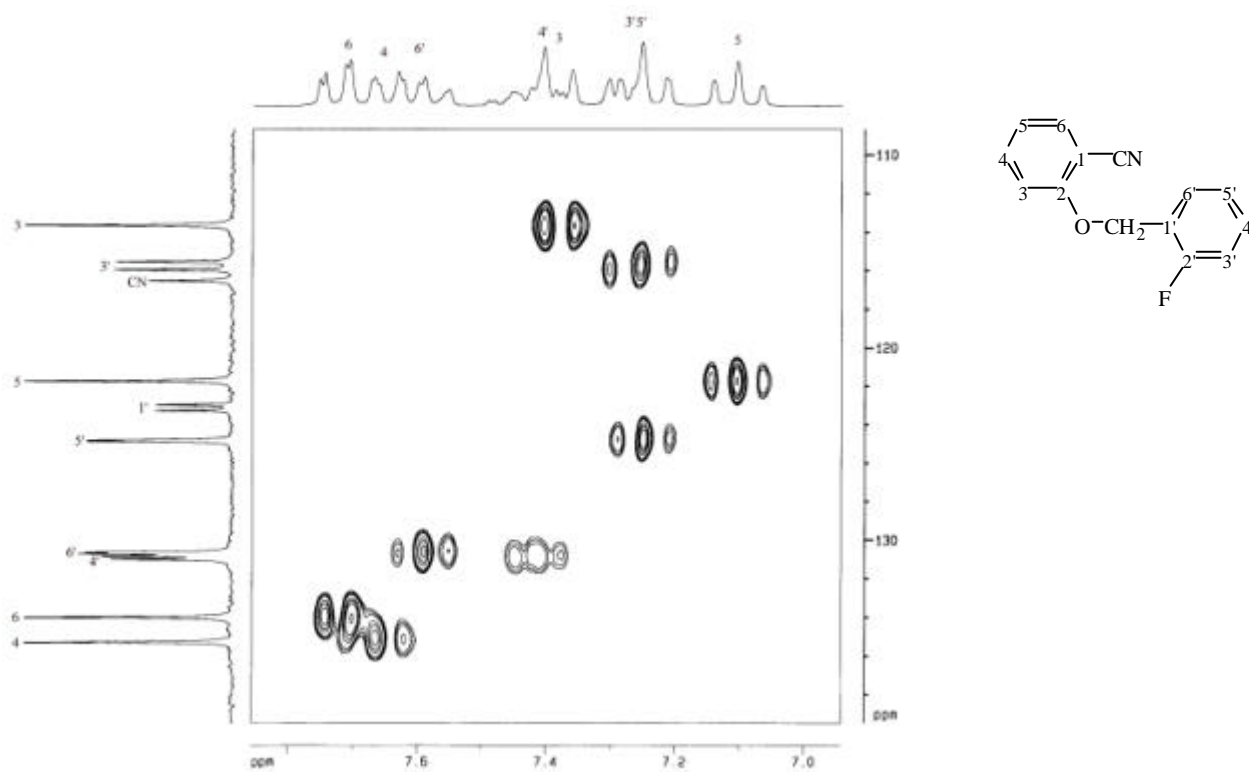


圖 21-6 HMQC (DMSO- $d_6$ ) spectrum of compound **21**

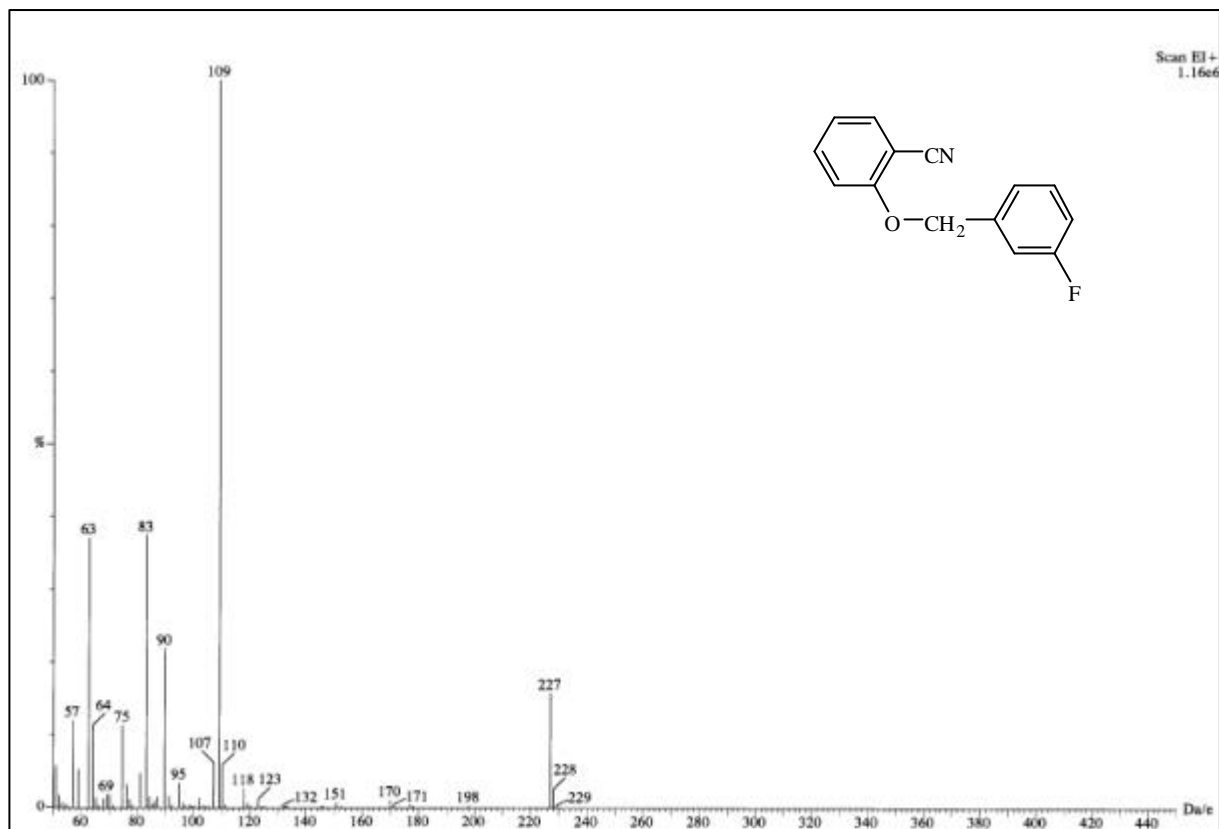


圖 22-1 MS spectrum of compound 22

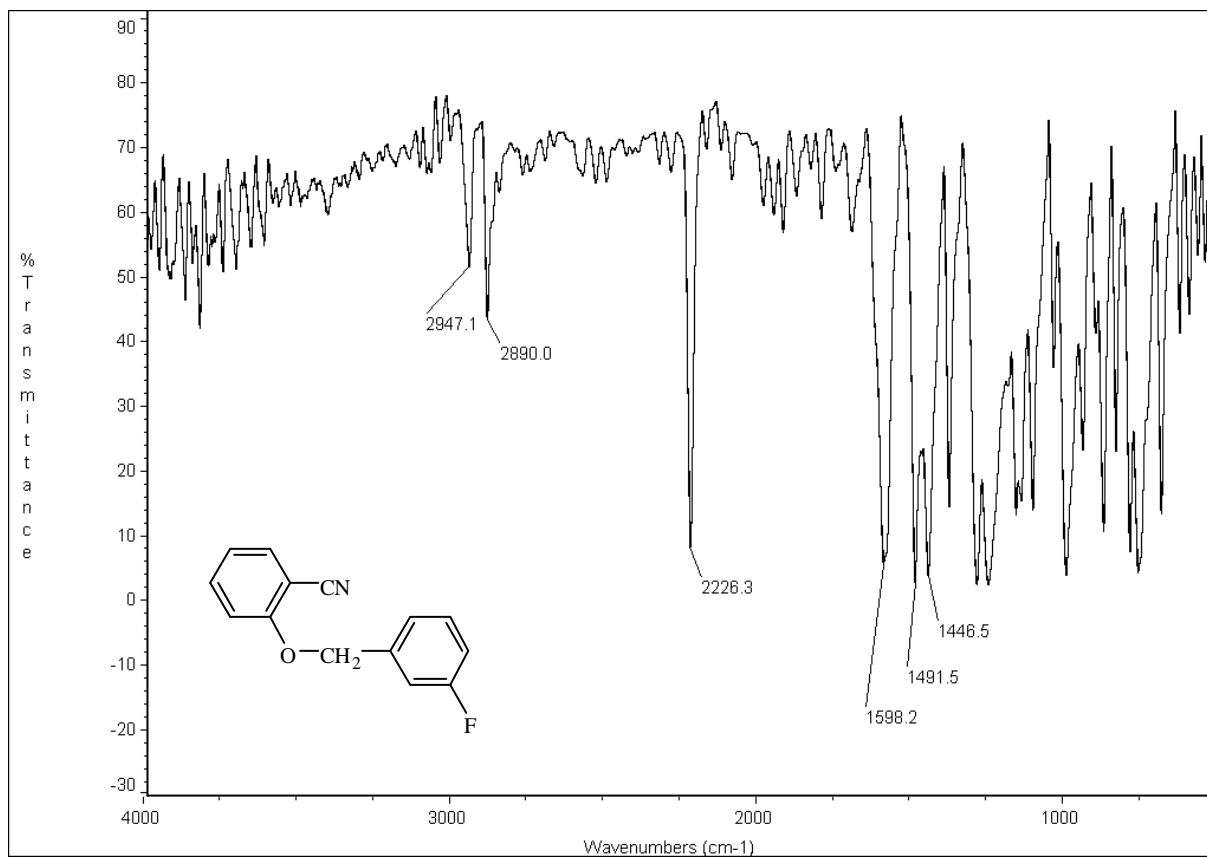


圖 22-2 IR (KBr) spectrum of compound 22

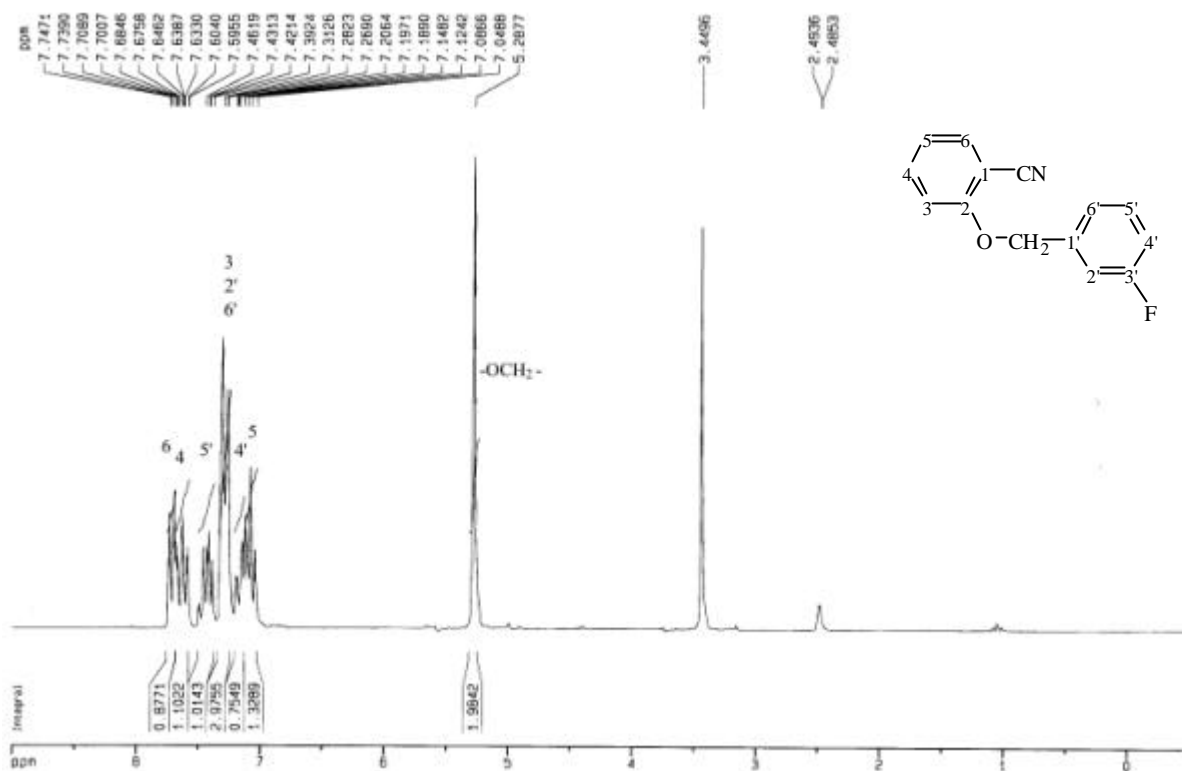


圖 22-3 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound **22**

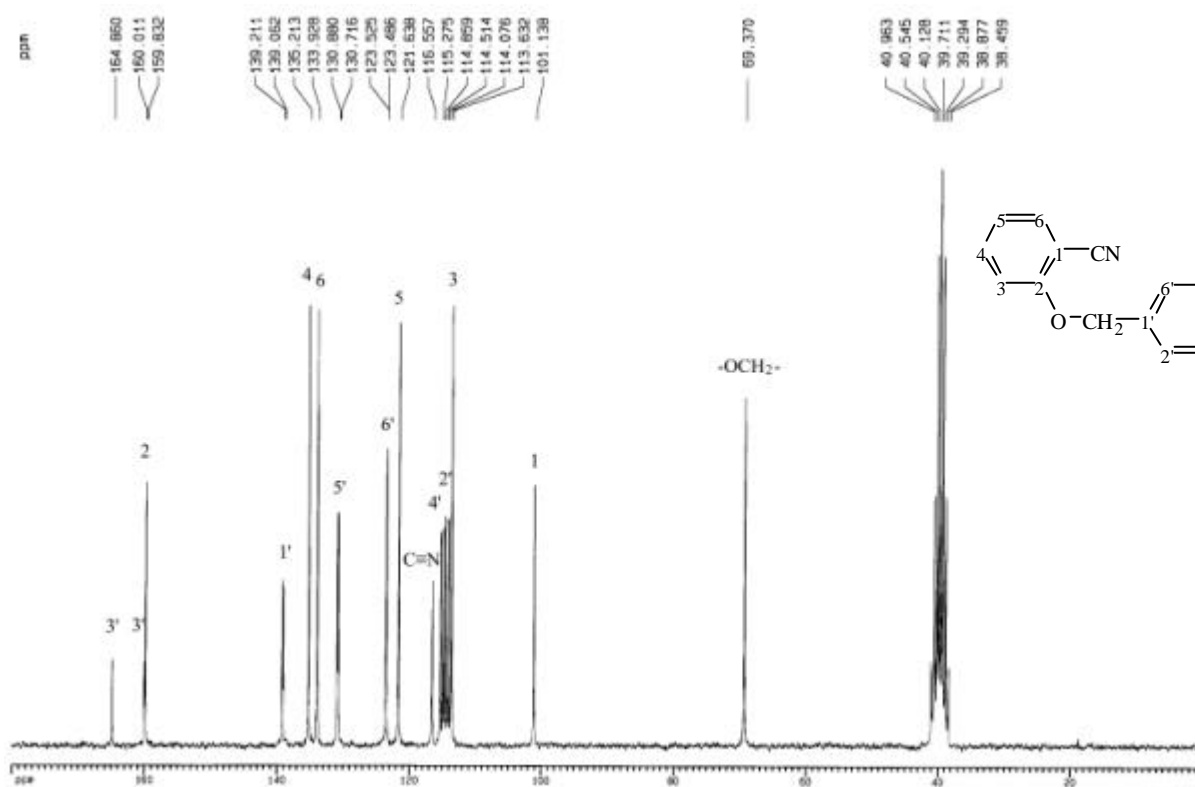


圖 22-4 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound **22**

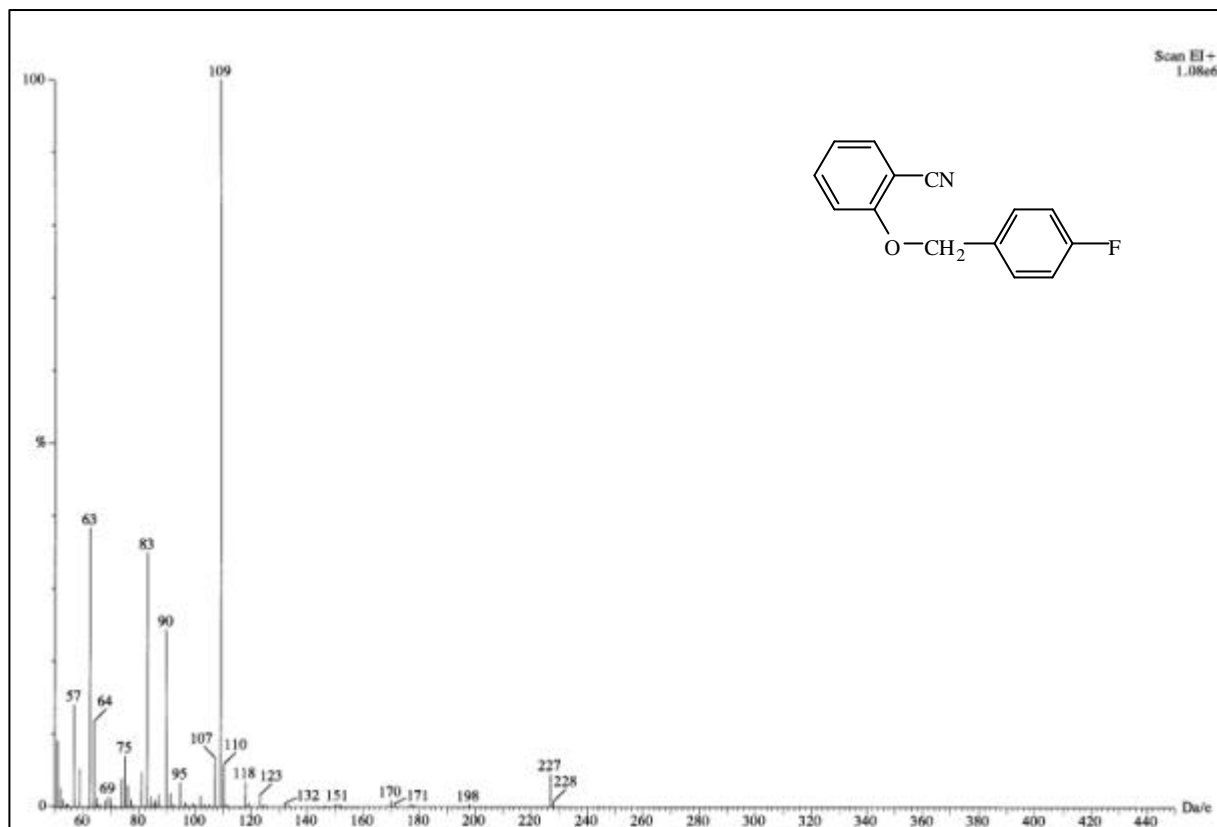


圖 23-1 MS spectrum of compound **23**

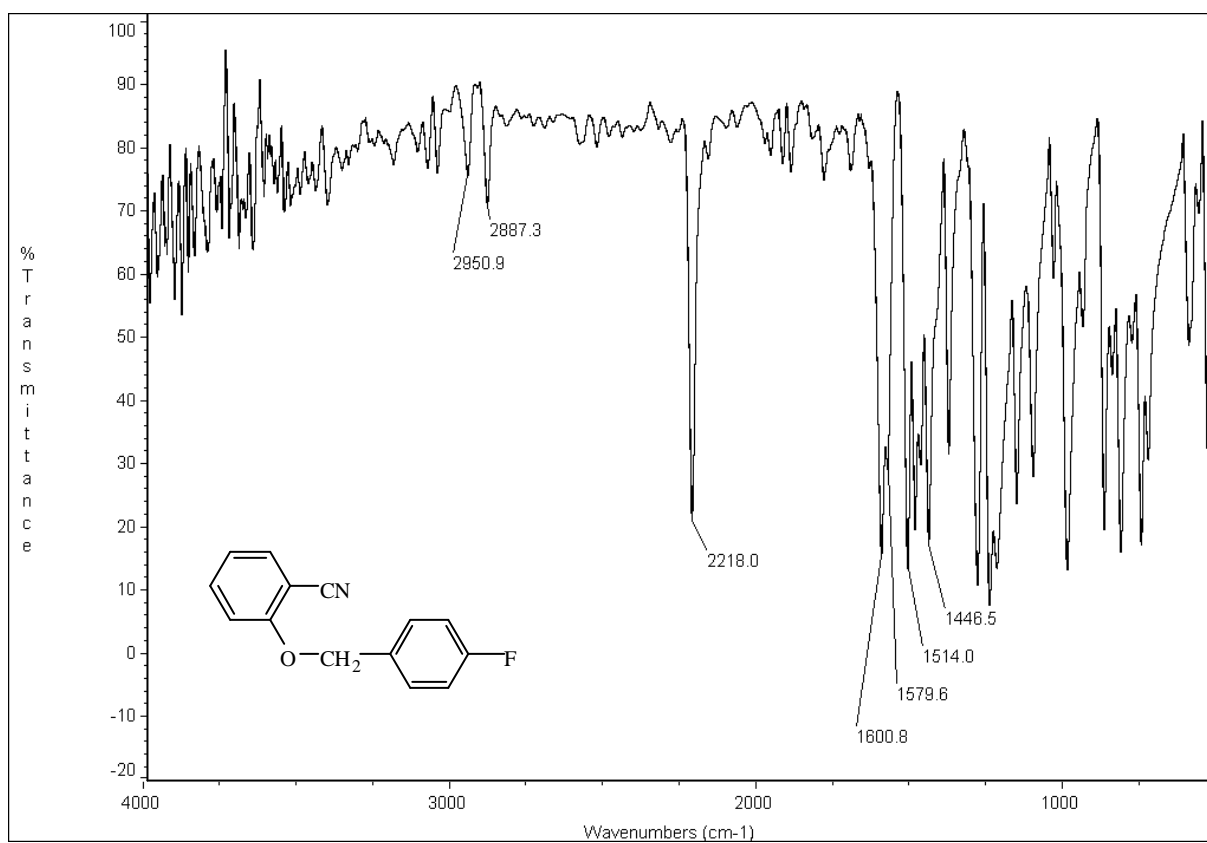


圖 23-2 IR (KBr) spectrum of compound **23**

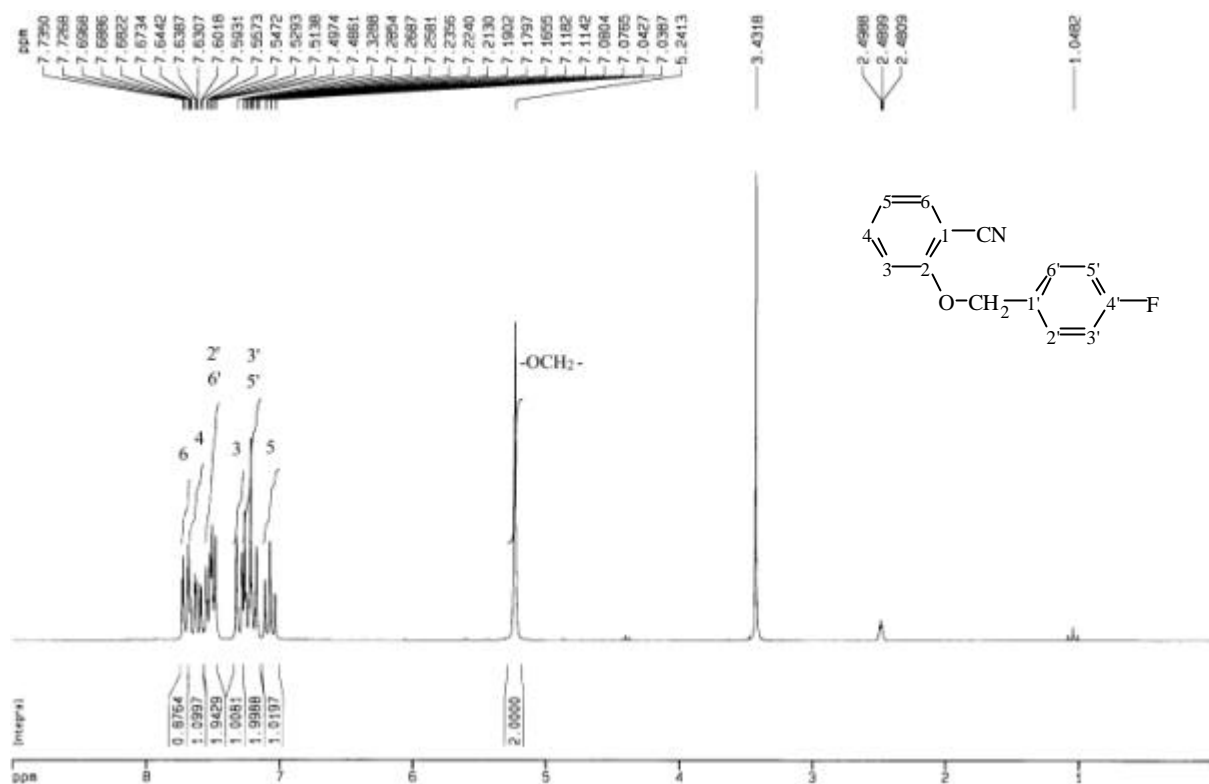


圖 23-3  $^1\text{H-NMR}$  (DMSO- $d_6$ , 200 MHz) spectrum of compound **23**

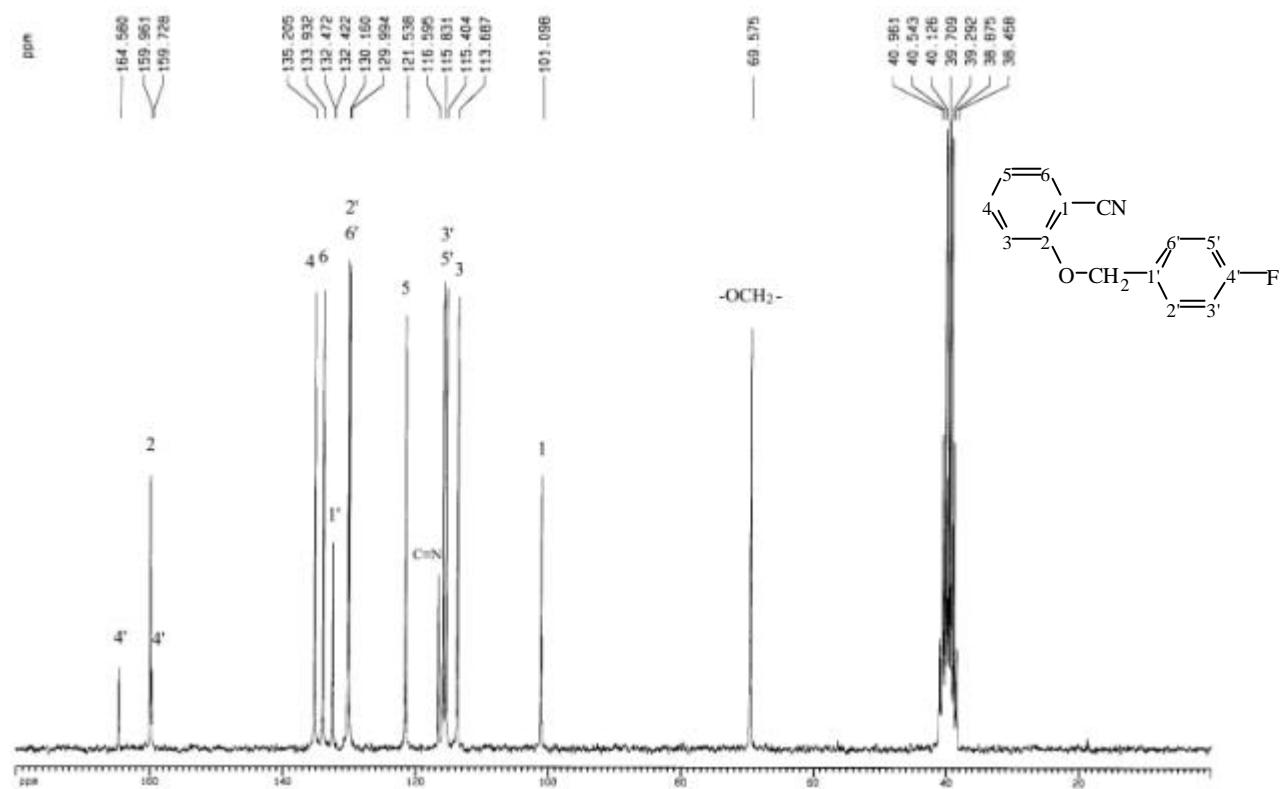


圖 23-4  $^{13}\text{C-NMR}$  (DMSO- $d_6$ , 50 MHz) spectrum of compound **23**

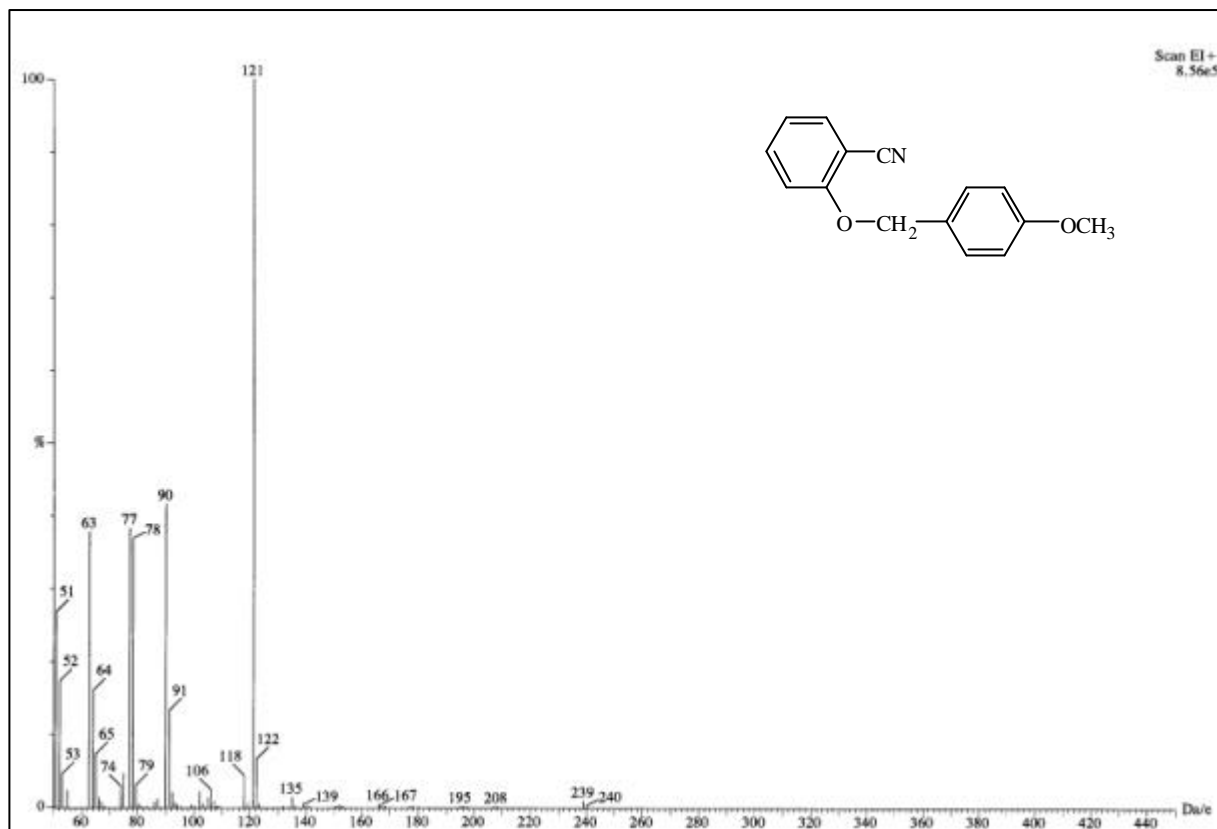


圖 25-1 MS spectrum of compound 25

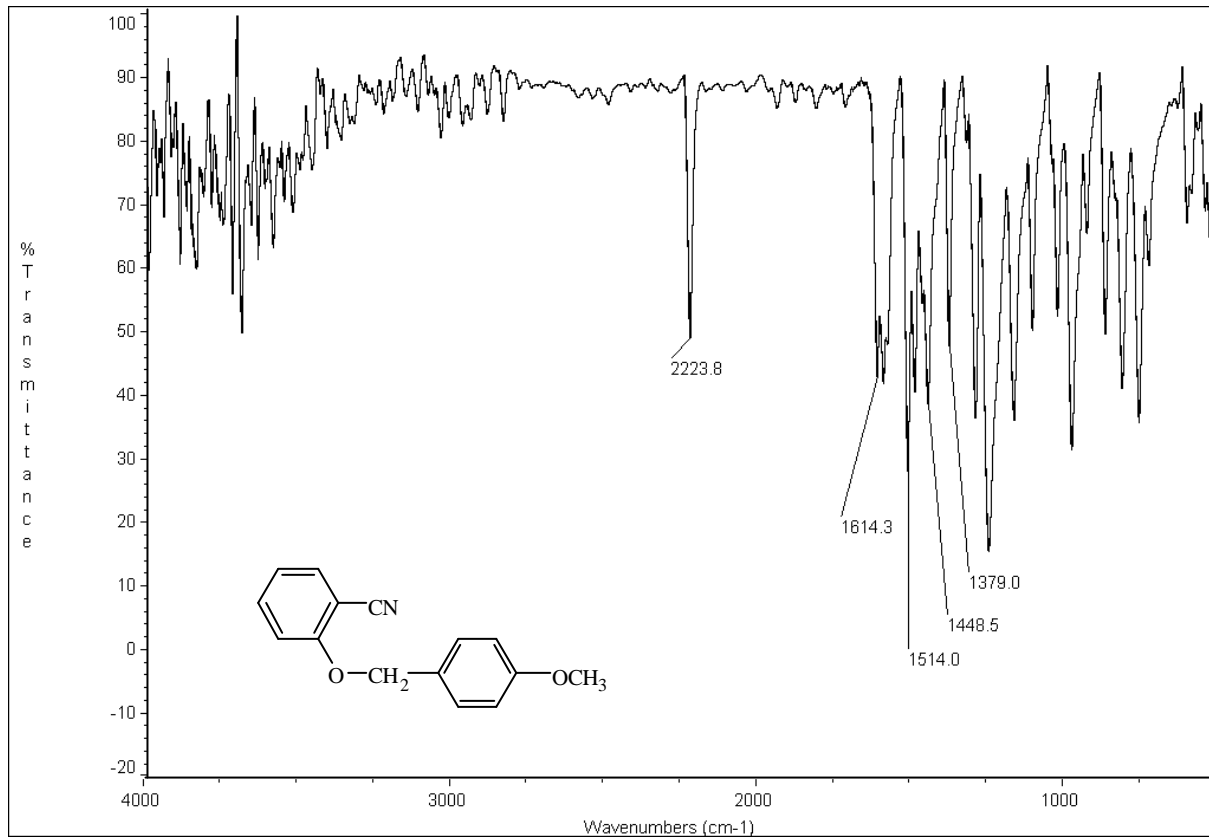


圖 25-2 IR (KBr) spectrum of compound 25



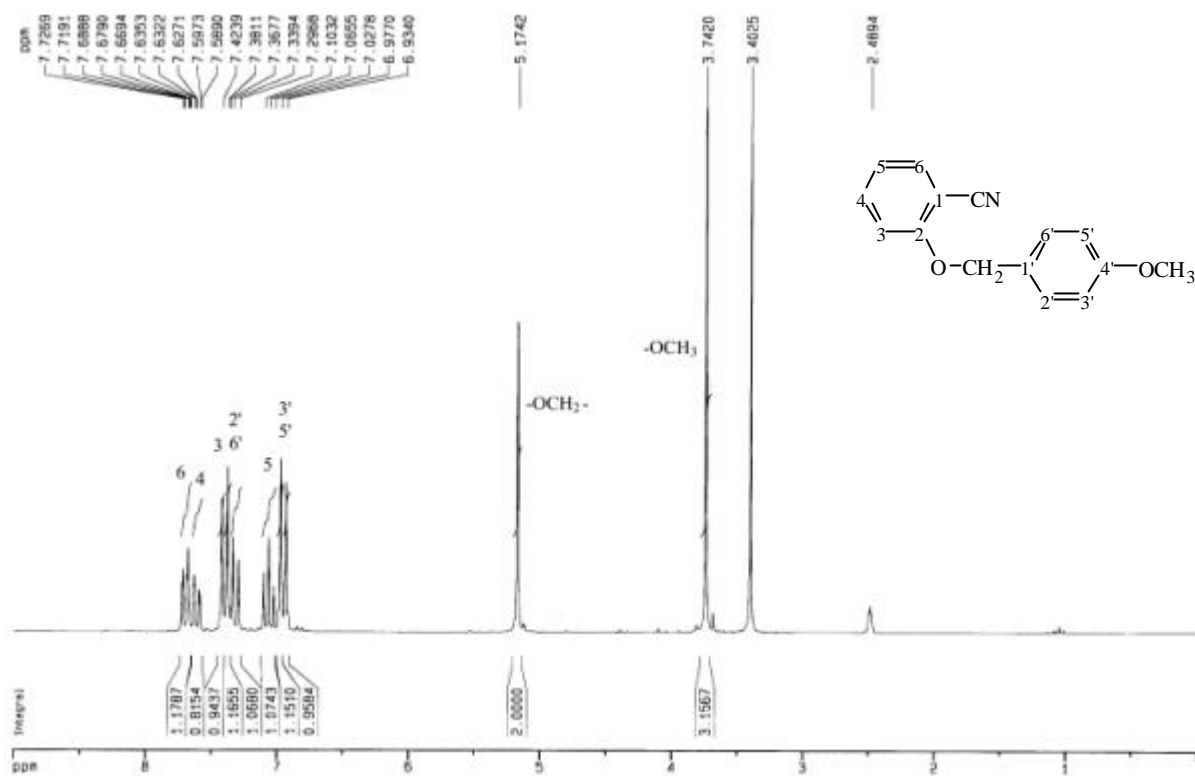


圖 25-3  $^1\text{H-NMR}$  ( $\text{DMSO-}d_6$ , 200 MHz) spectrum of compound

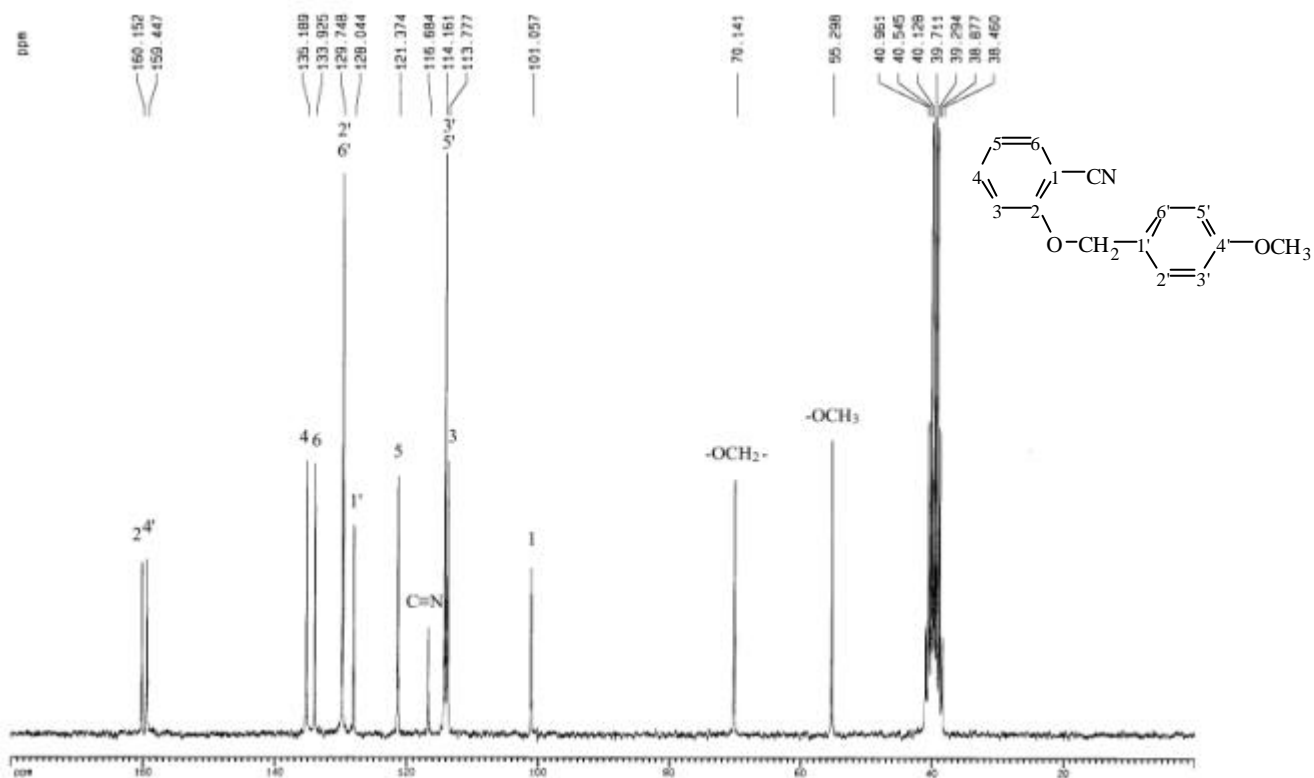


圖 25-4  $^{13}\text{C-NMR}$  ( $\text{DMSO-}d_6$ , 50 MHz) spectrum of compound **25**

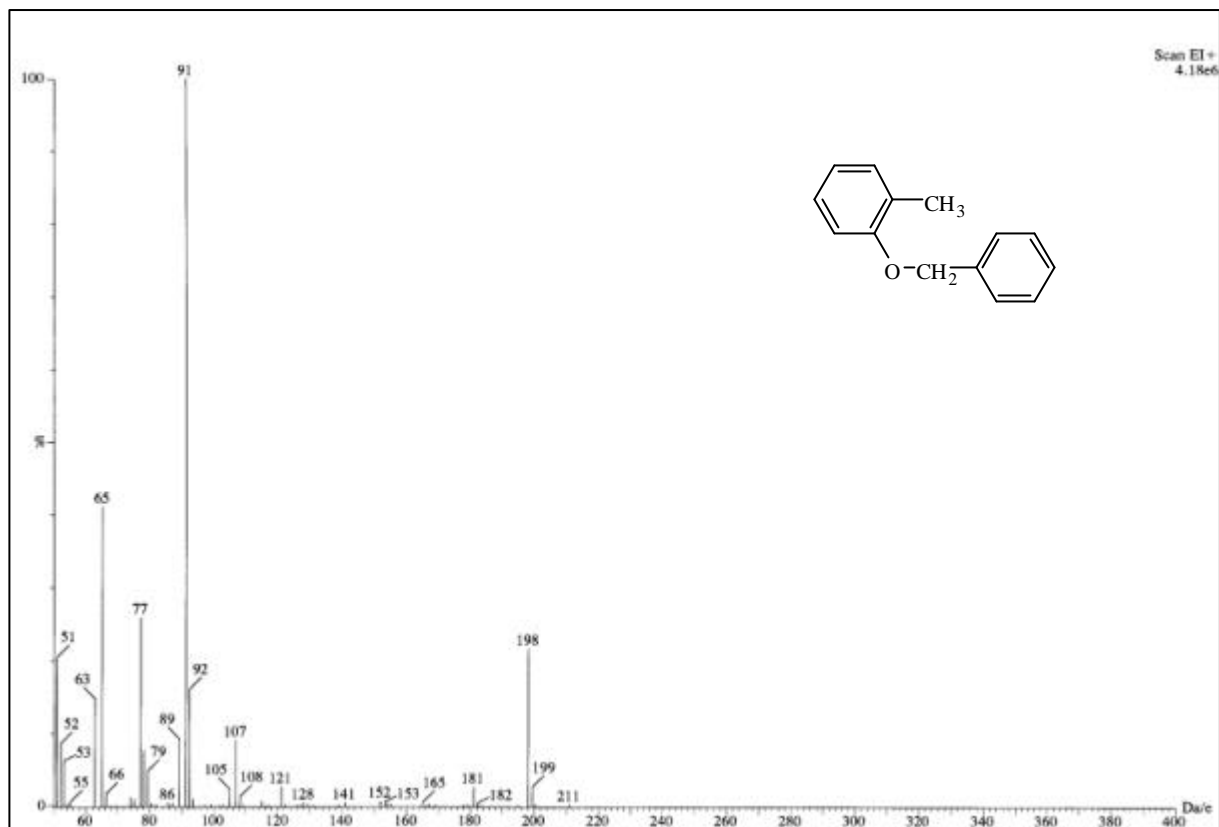


圖 26-1 MS spectrum of compound 26

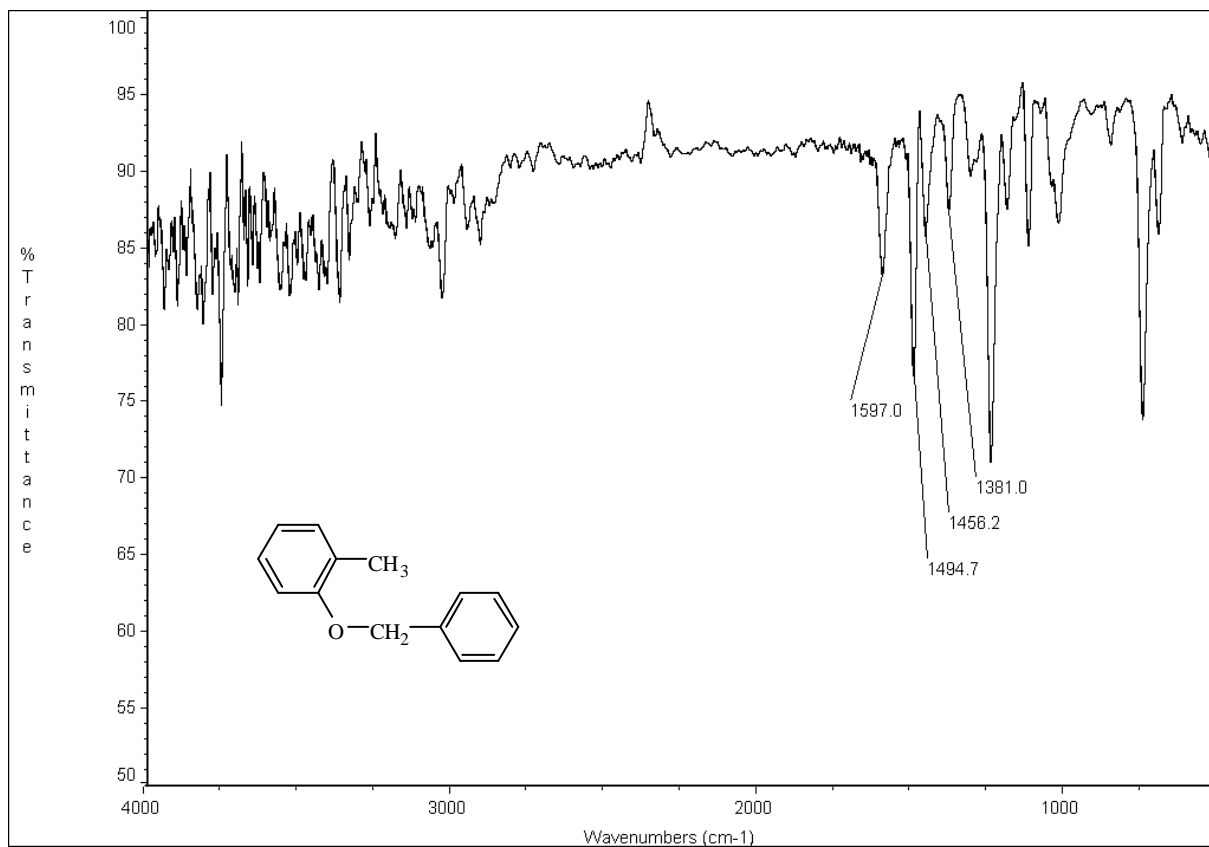


圖 26-2 IR (KBr) spectrum of compound 26

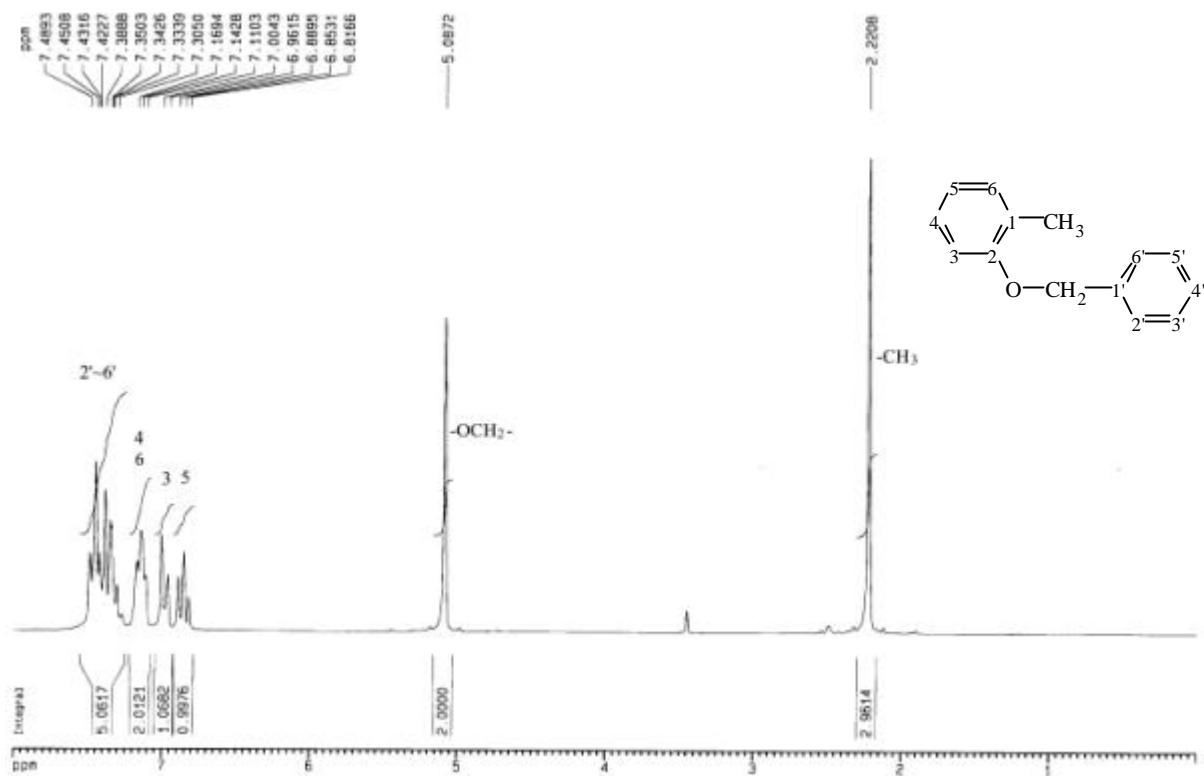


圖 26-3  $^1\text{H-NMR}$  ( $\text{DMSO-}d_6$ , 200 MHz) spectrum of compound **26**

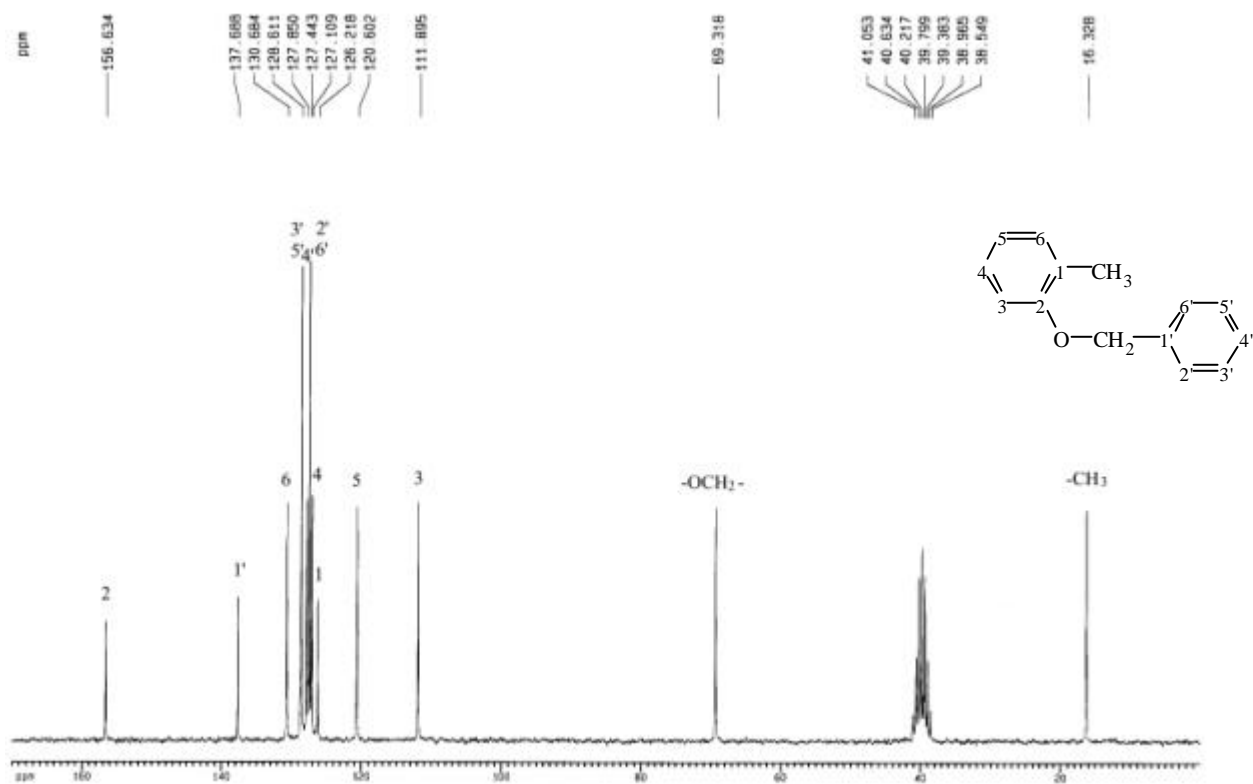


圖 26-4  $^{13}\text{C-NMR}$  ( $\text{DMSO-}d_6$ , 50 MHz) spectrum of compound **26**

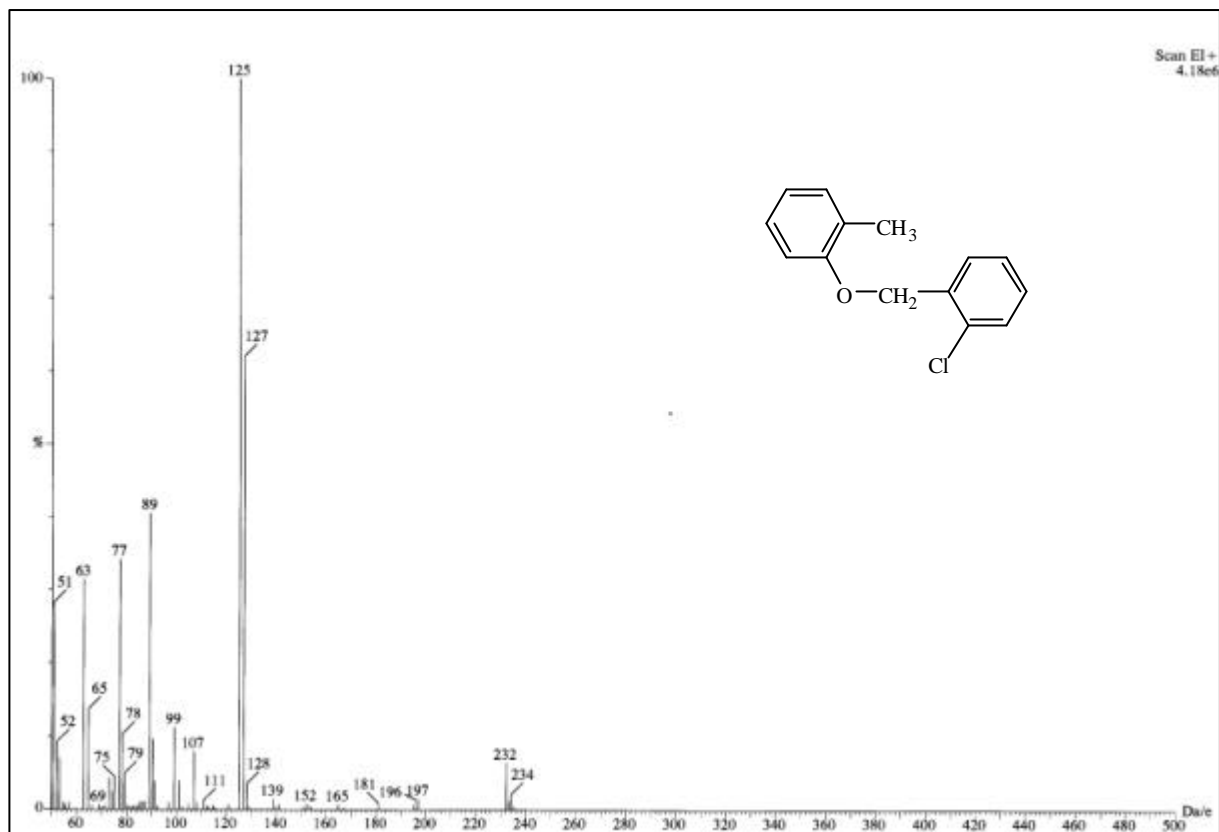


圖 27-1 MS spectrum of compound 27

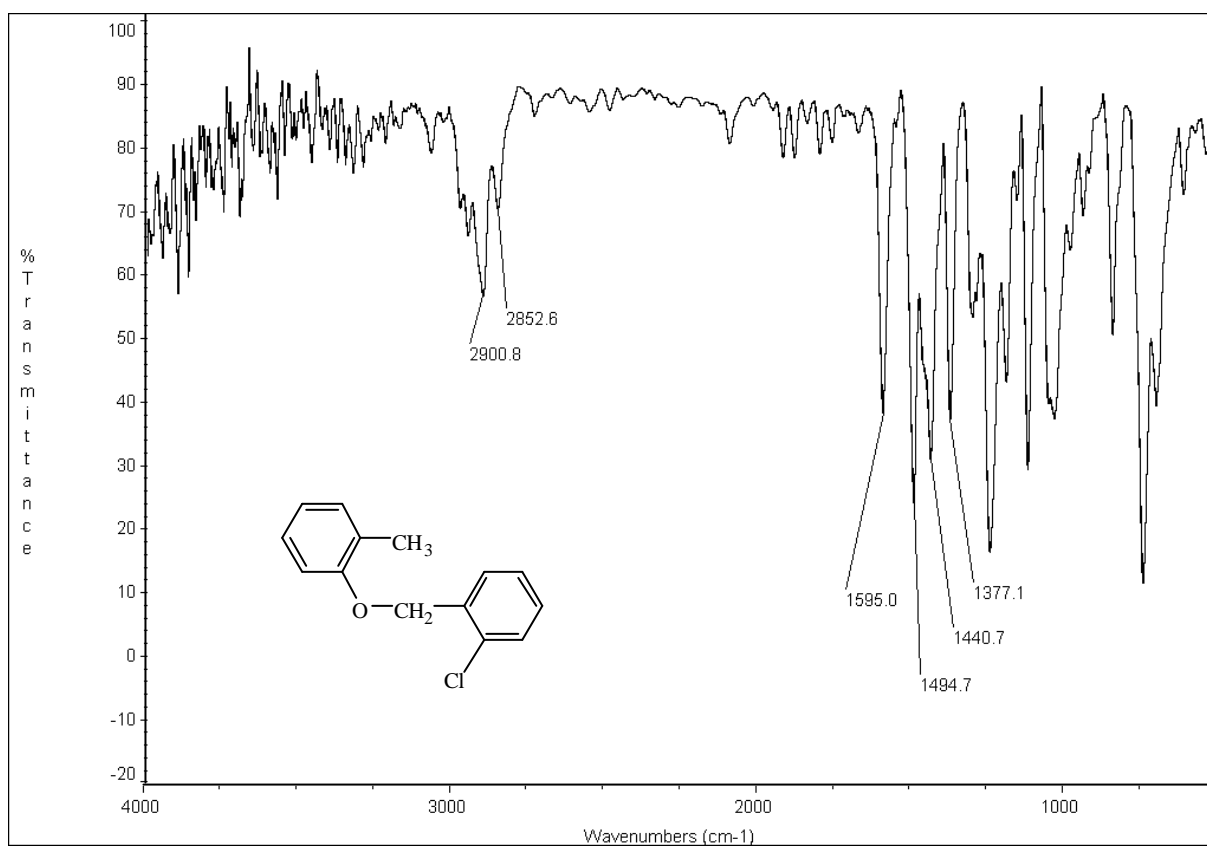


圖 27-2 IR (KBr) spectrum of compound 27

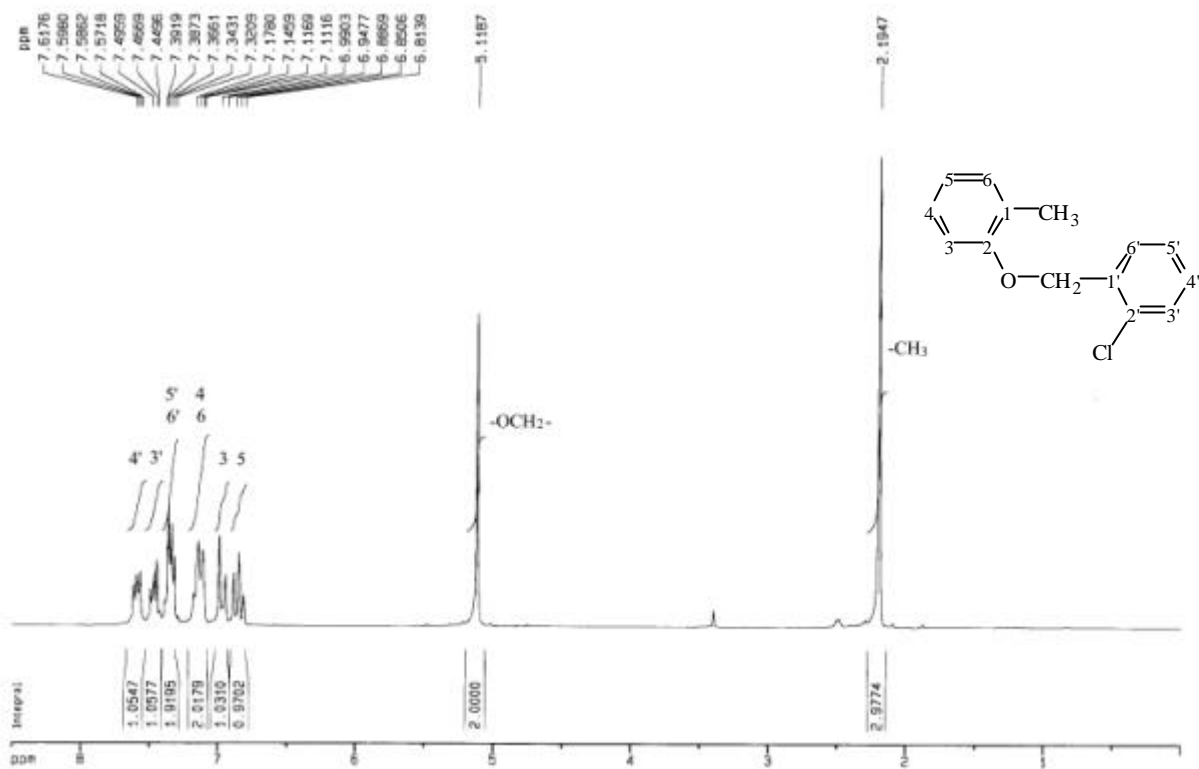


圖 27-3 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound **27**

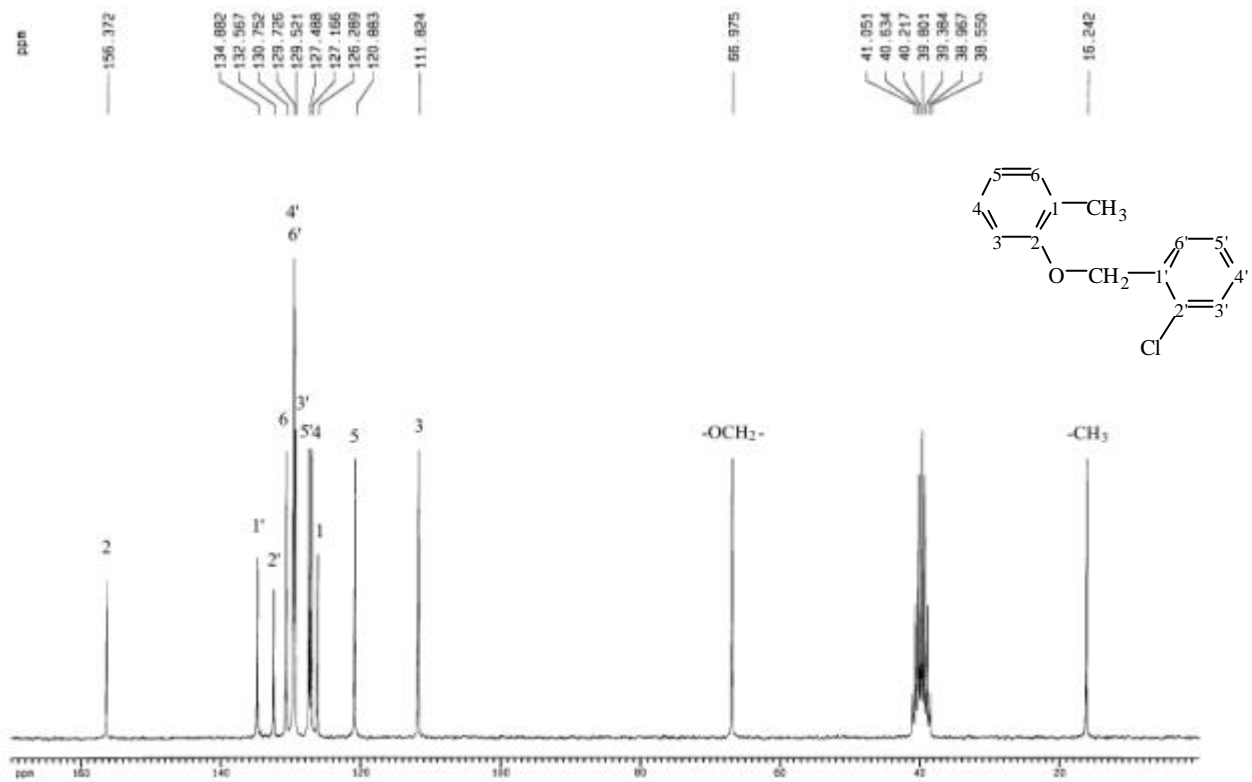


圖 27-4 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound **27**

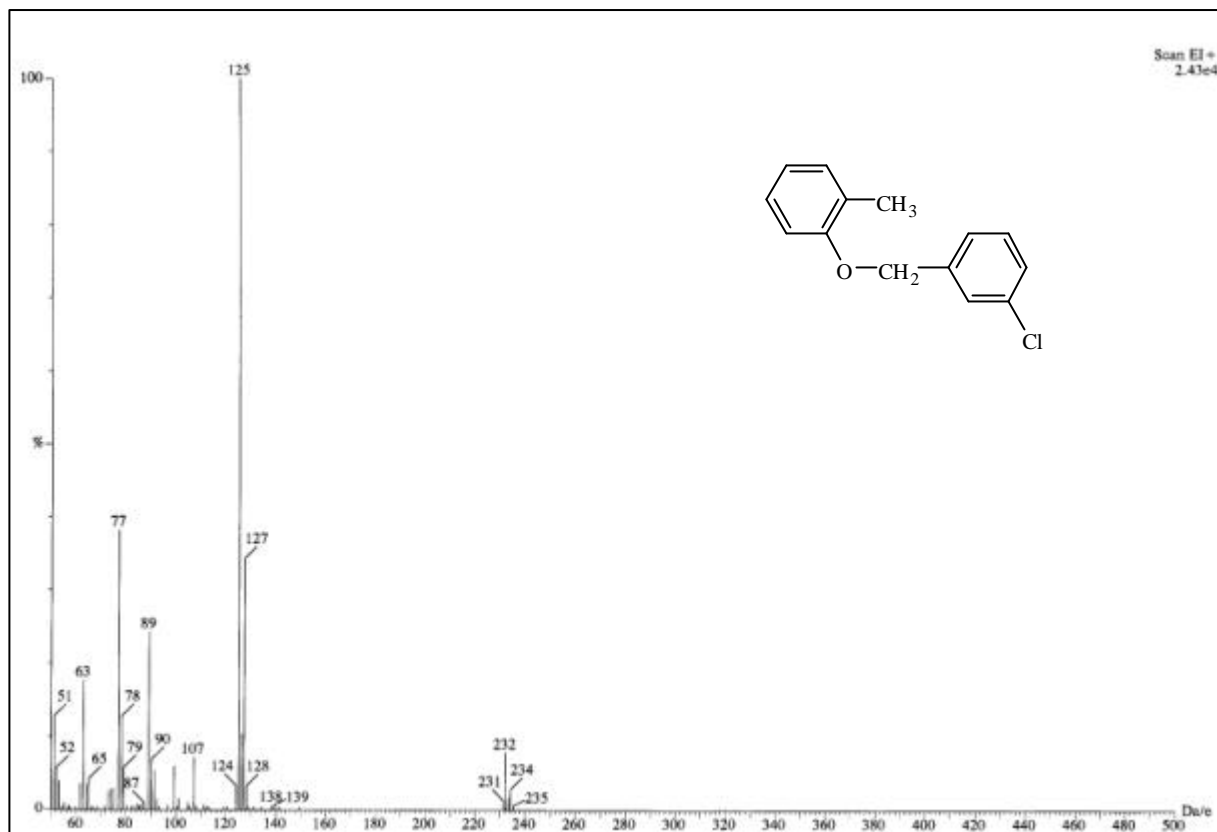


圖 28-1 MS spectrum of compound 28

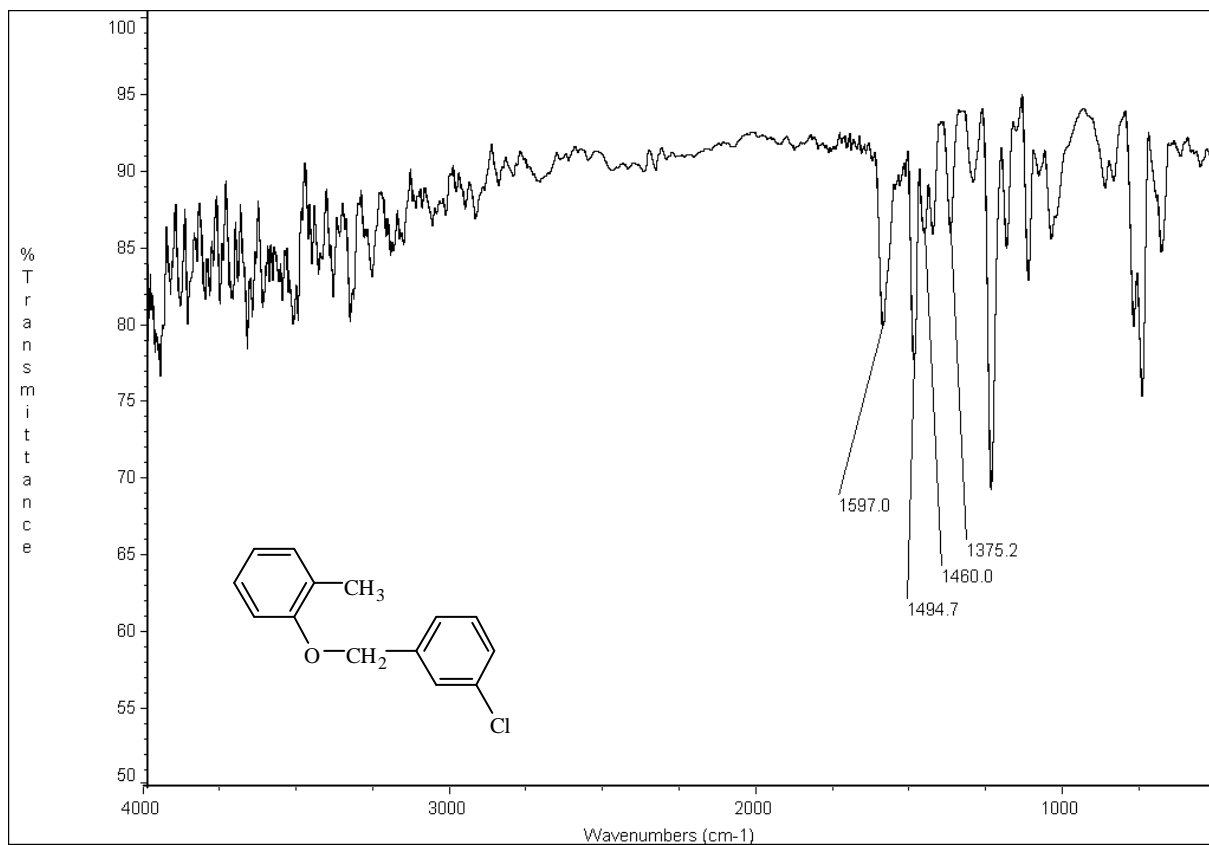


圖 28-2 IR (KBr) spectrum of compound 28

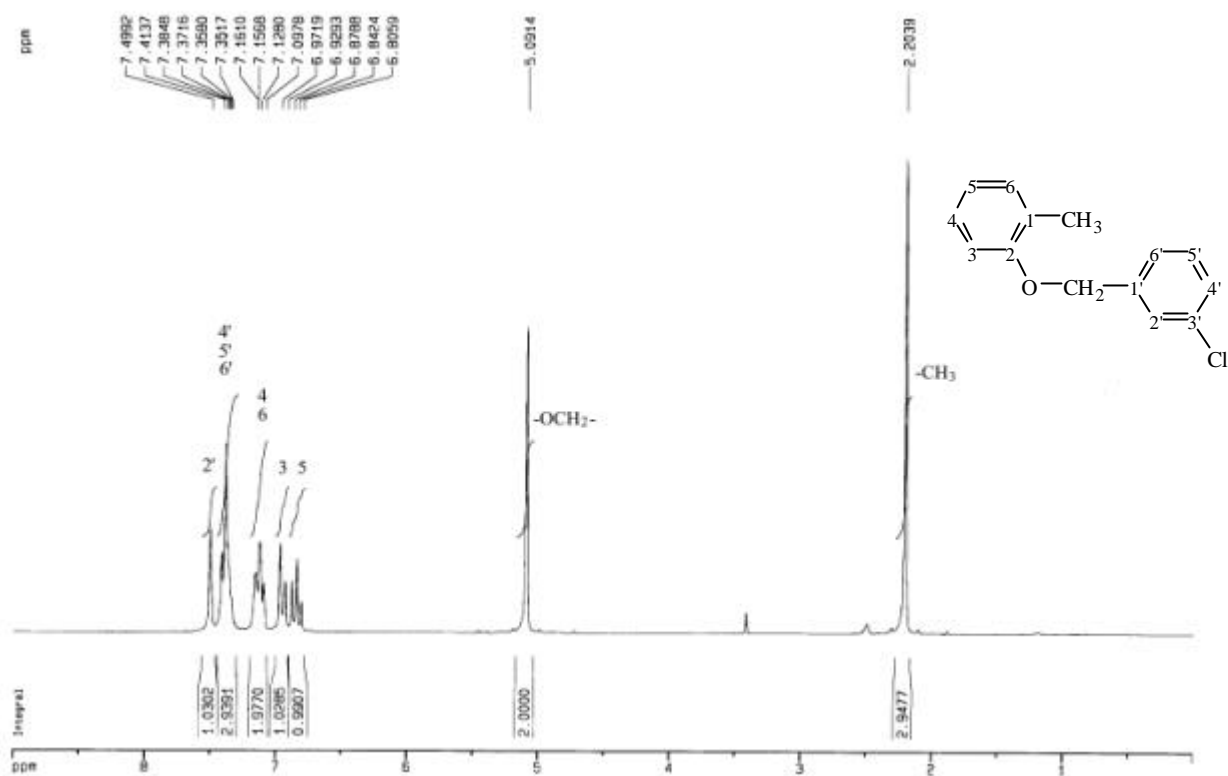


圖 28-3 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound **28**

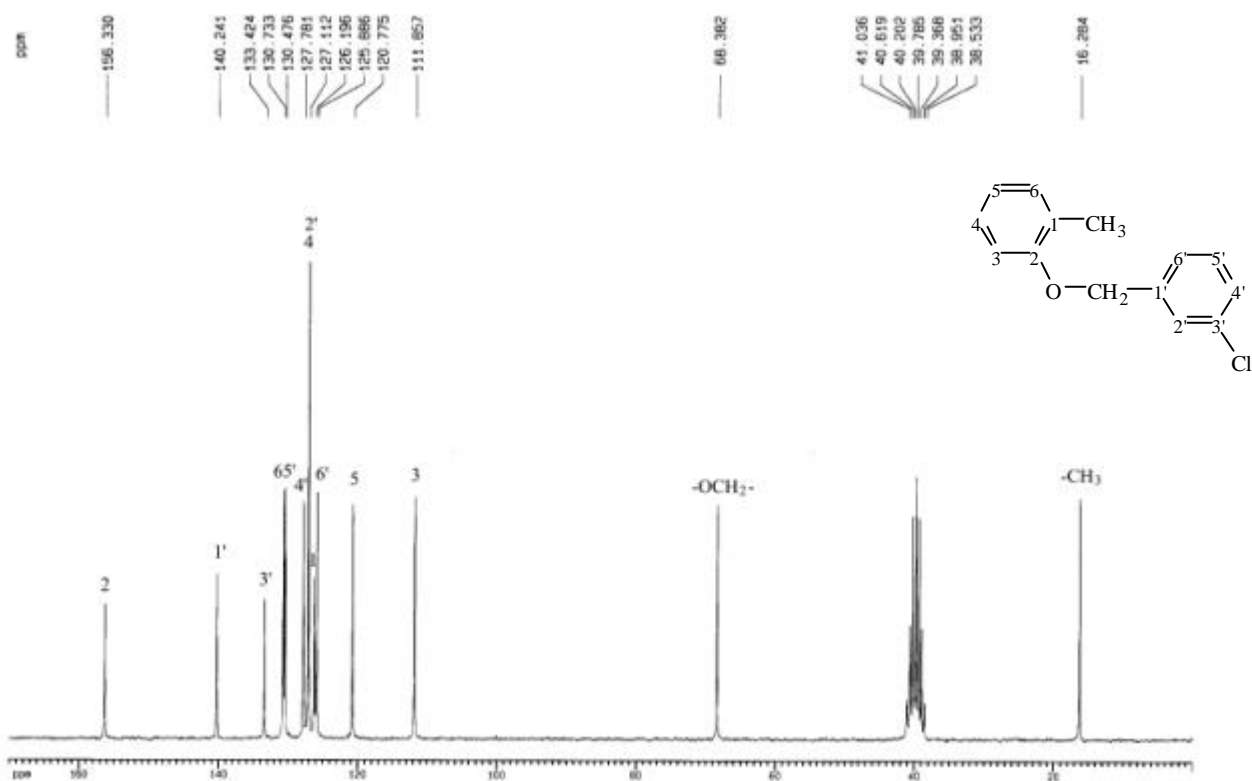


圖 28-4 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound **28**

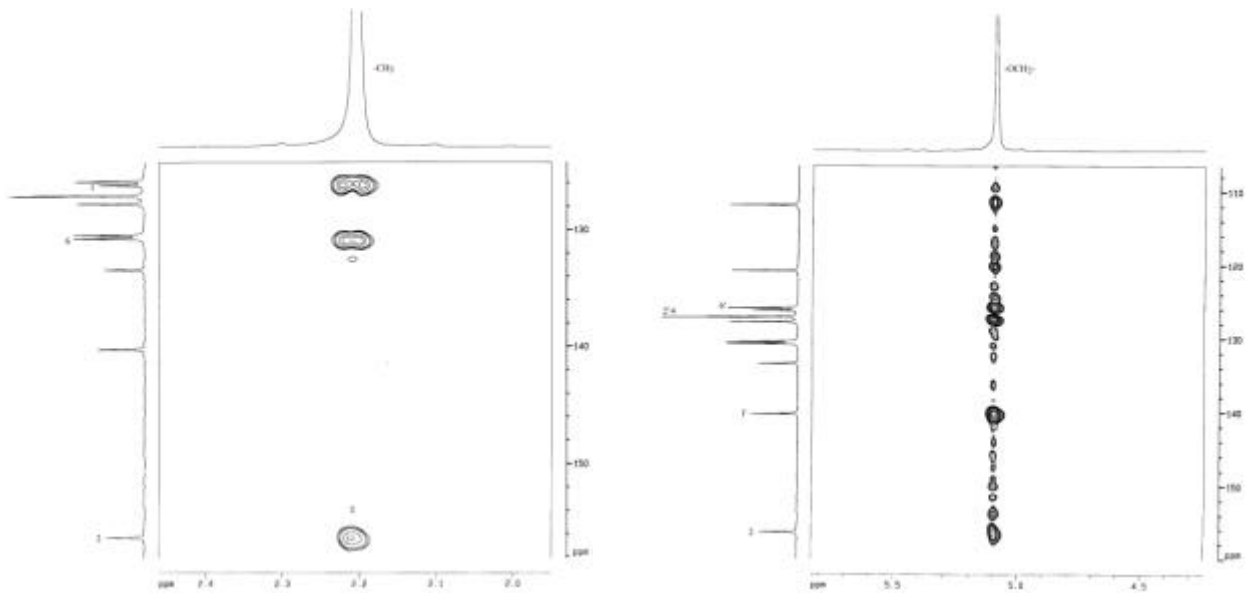
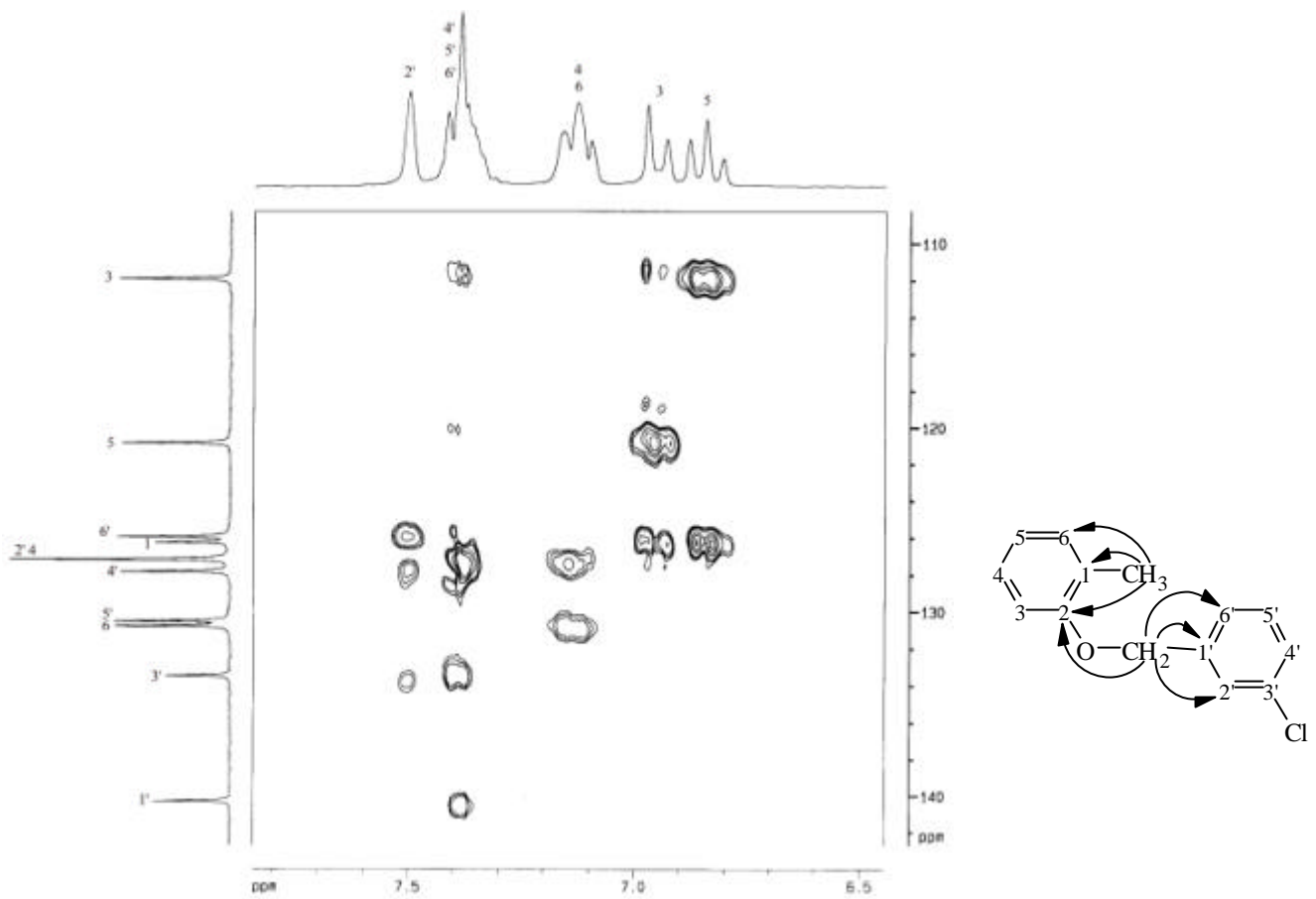


圖 28-5 HMBC (DMSO-*d*<sub>6</sub>) spectrum of compound **28**



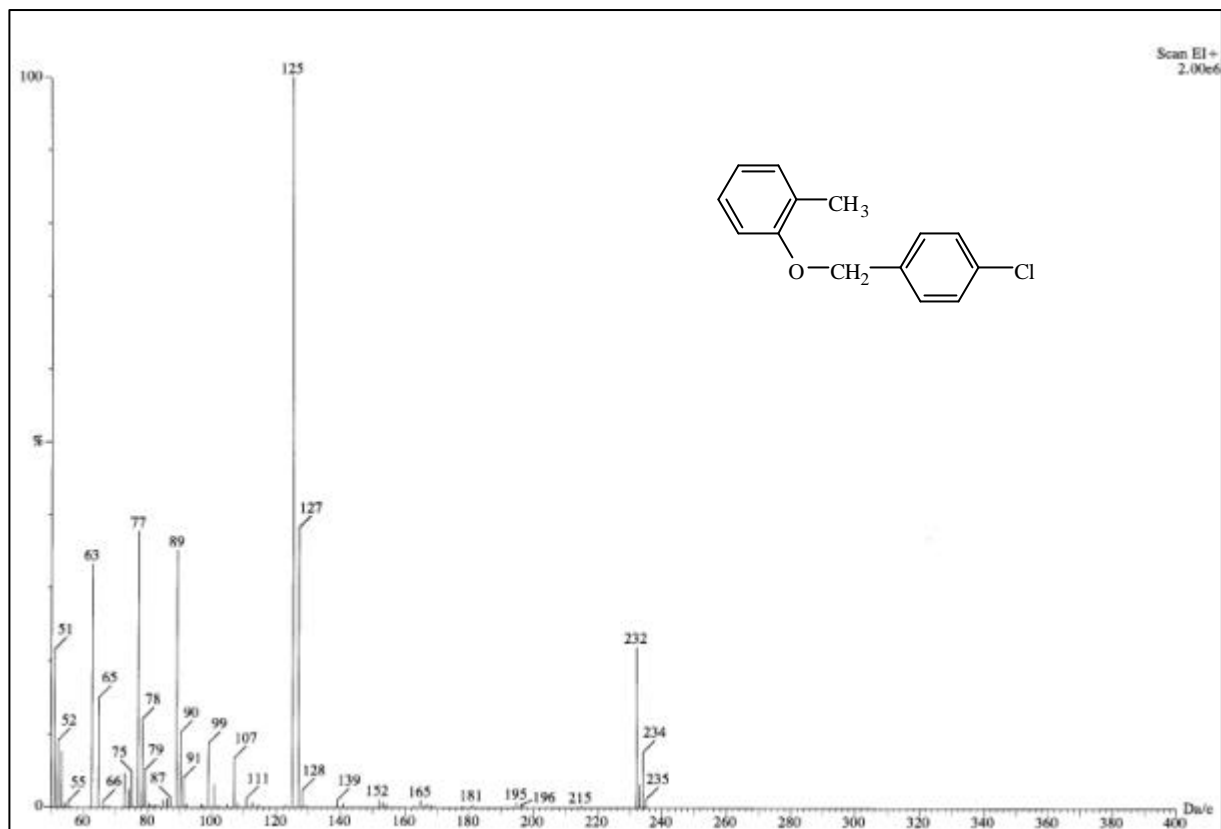


圖 29-1 MS spectrum of compound 29

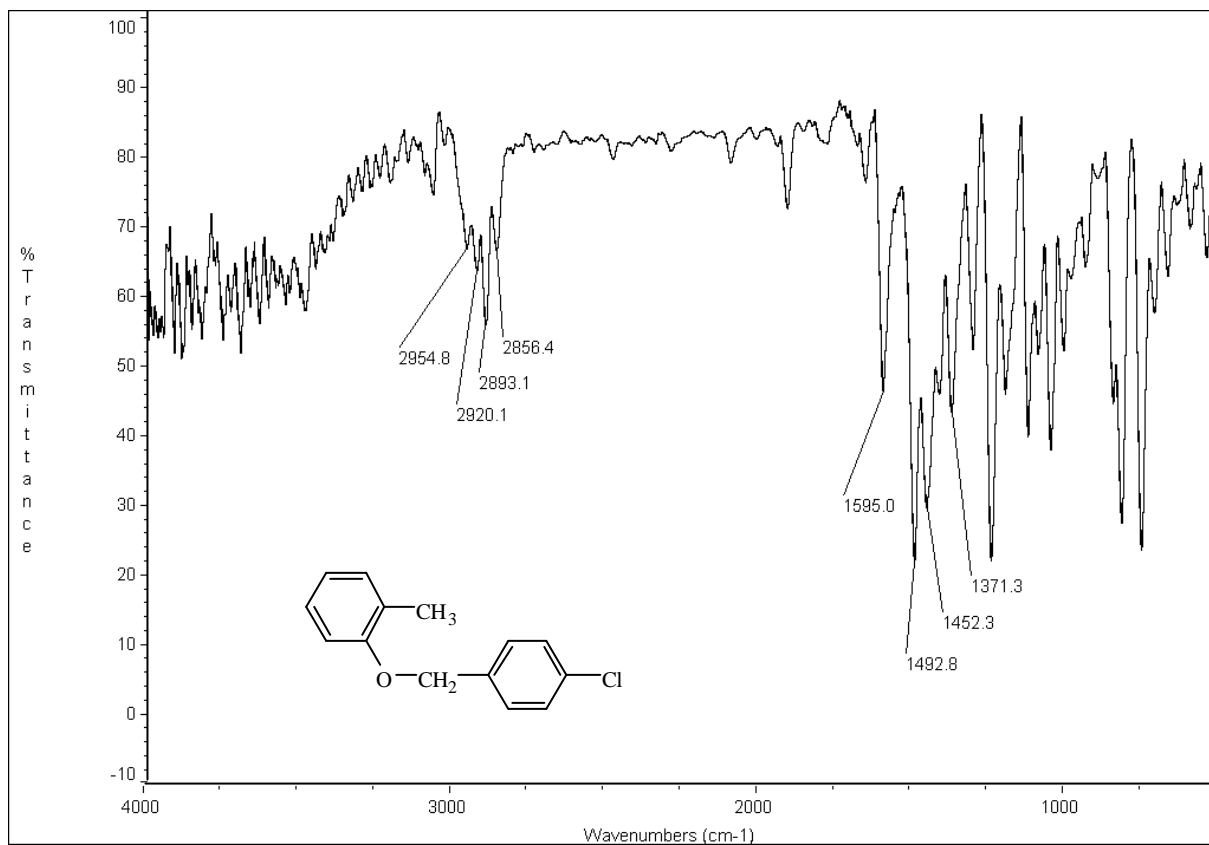


圖 29-2 IR (KBr) spectrum of compound 29

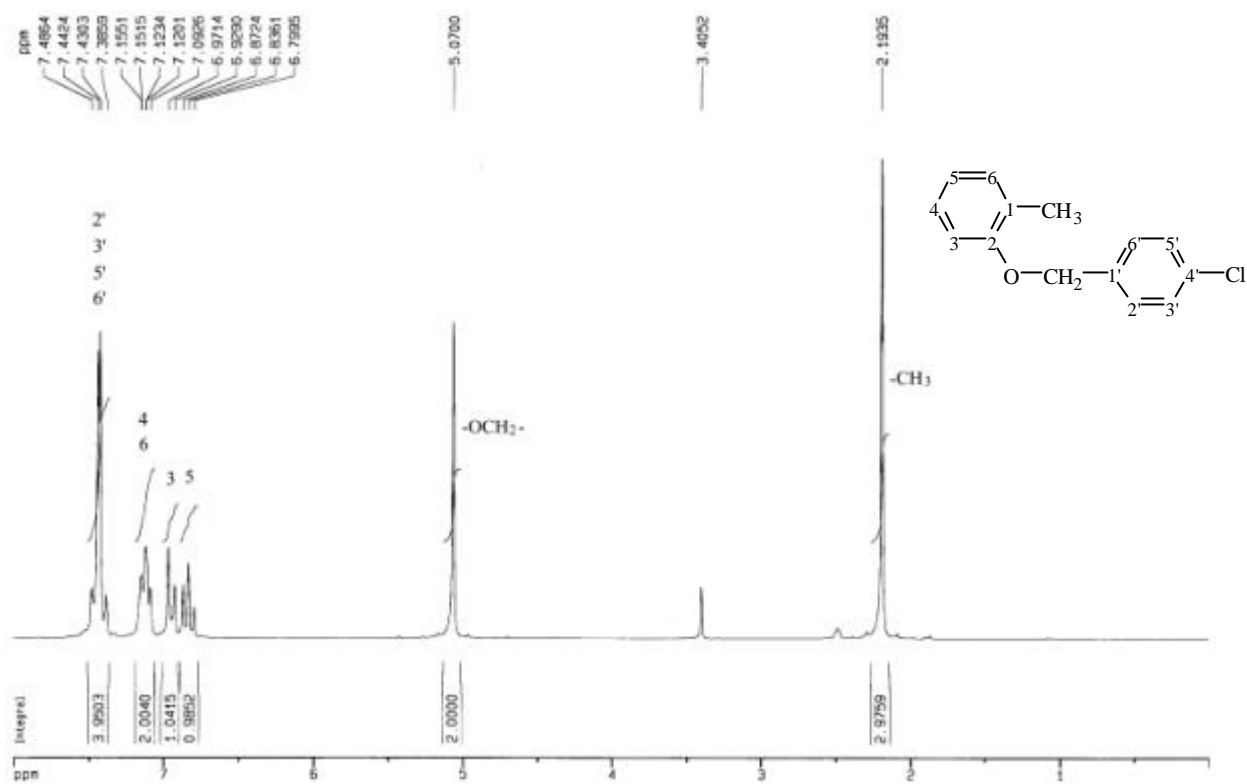


圖 29-3  $^1\text{H-NMR}$  (DMSO- $d_6$ , 200 MHz) spectrum of compound **29**

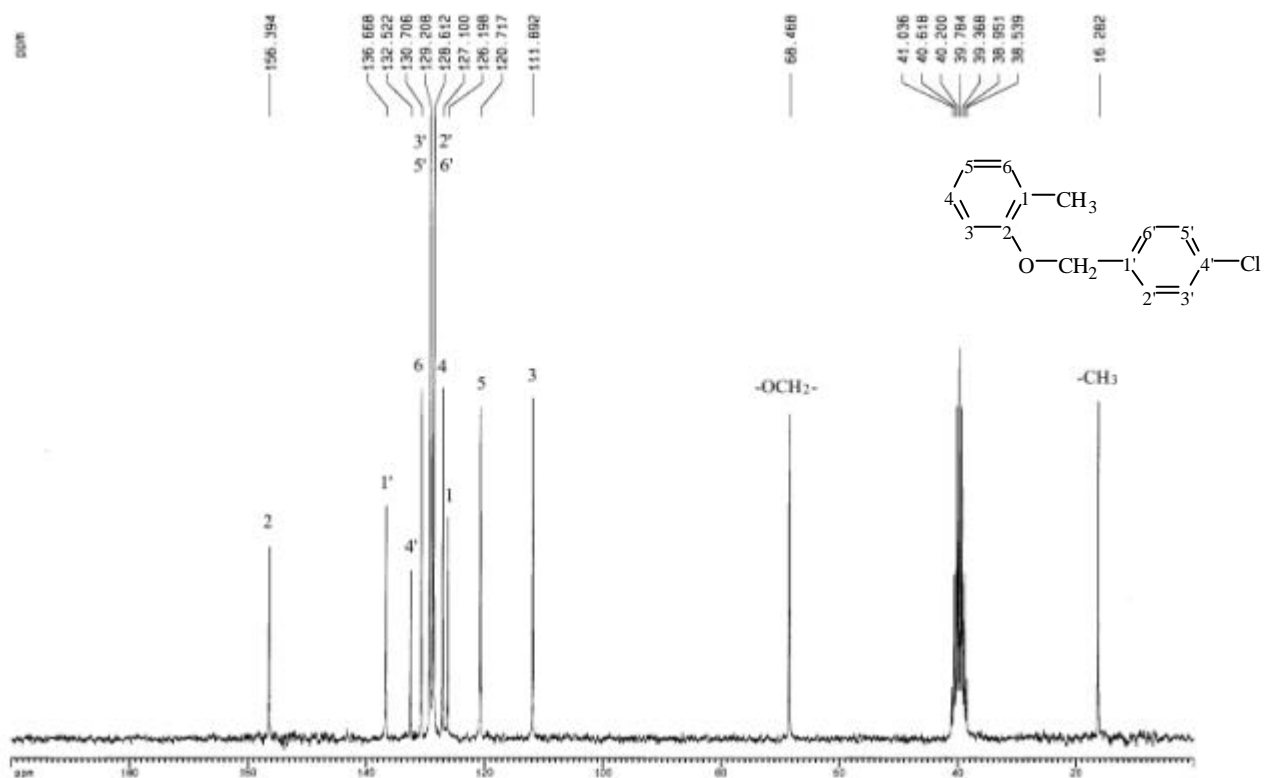


圖 29-4  $^{13}\text{C-NMR}$  (DMSO- $d_6$ , 50 MHz) spectrum of compound **29**

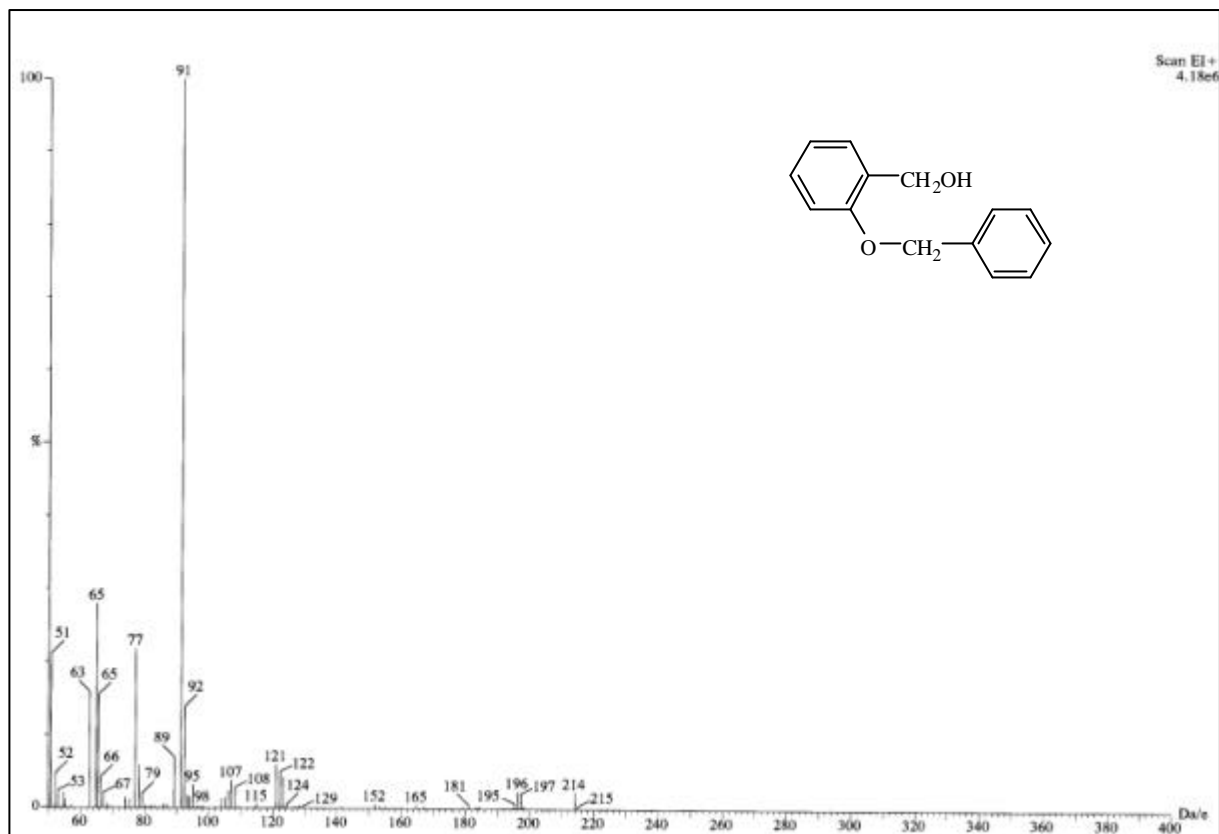


圖 30-1 MS spectrum of compound 30

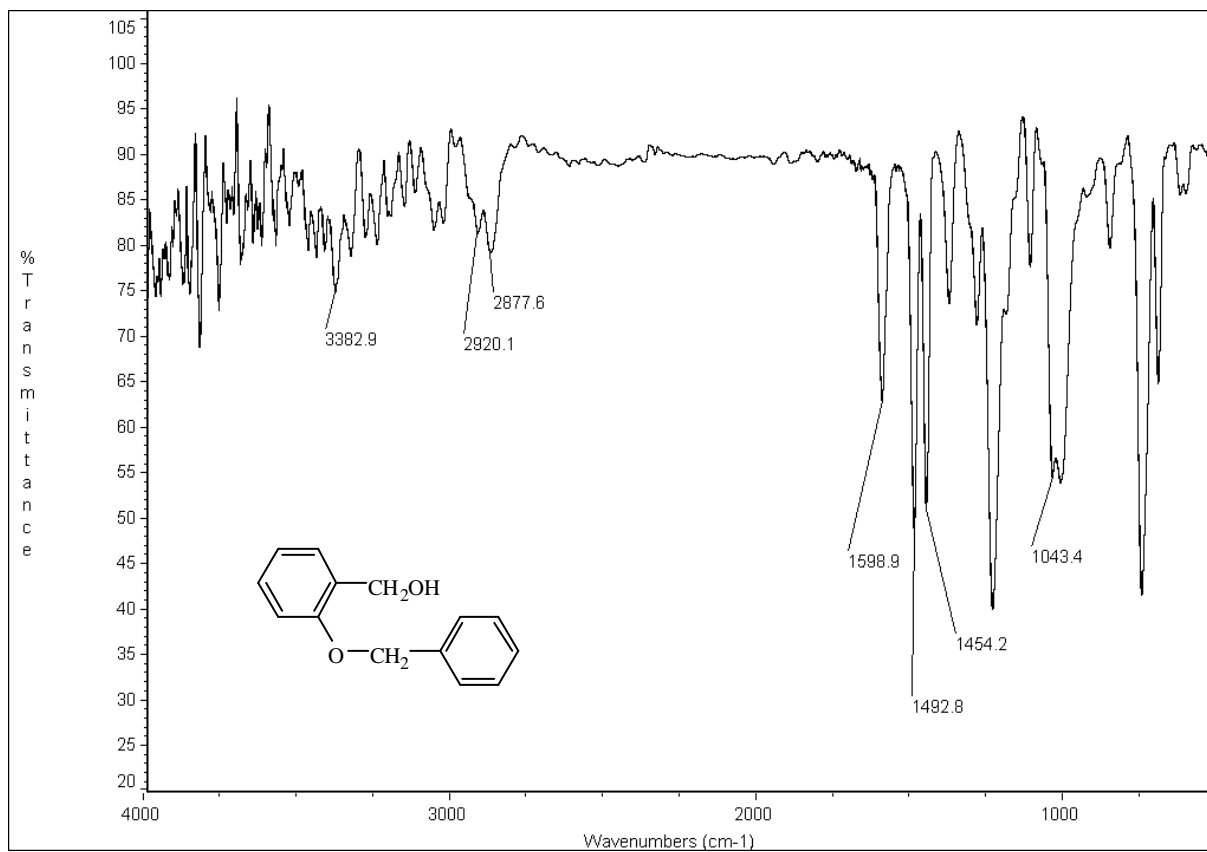


圖 30-2 IR (KBr) spectrum of compound 30

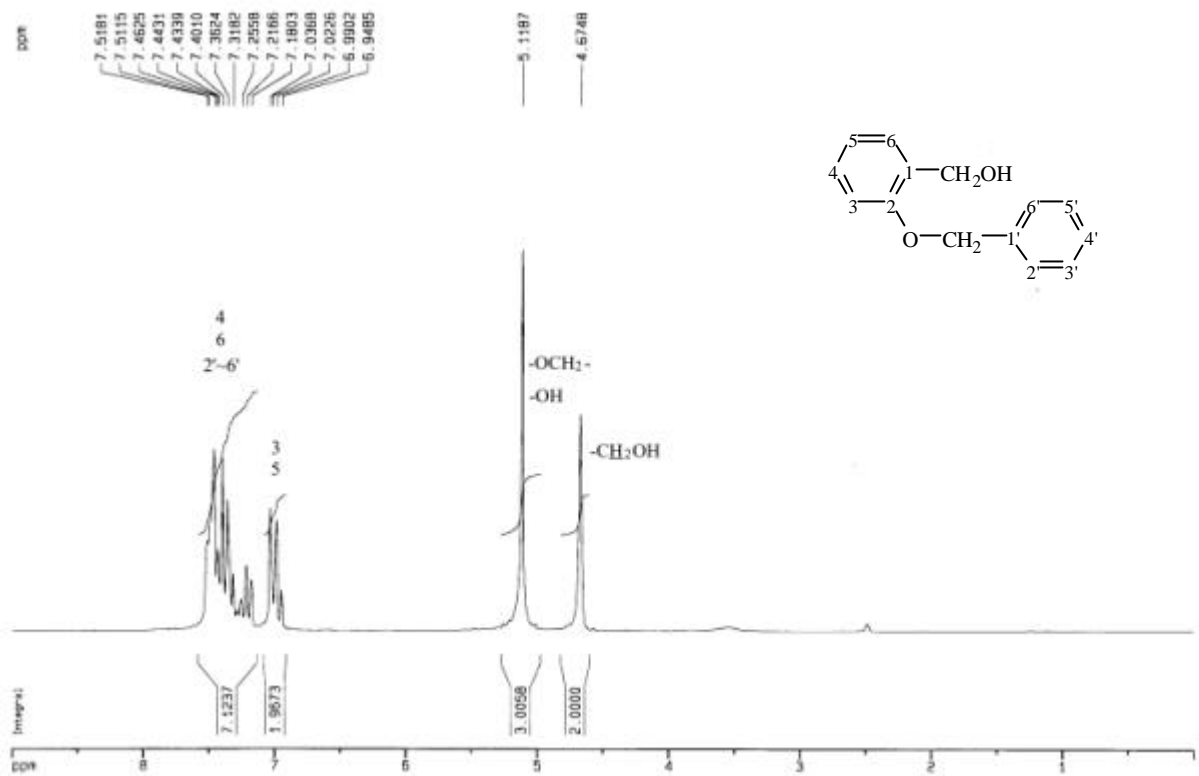


圖 30-3  $^1\text{H-NMR}$  (DMSO- $d_6$ , 200 MHz) spectrum of compound 30

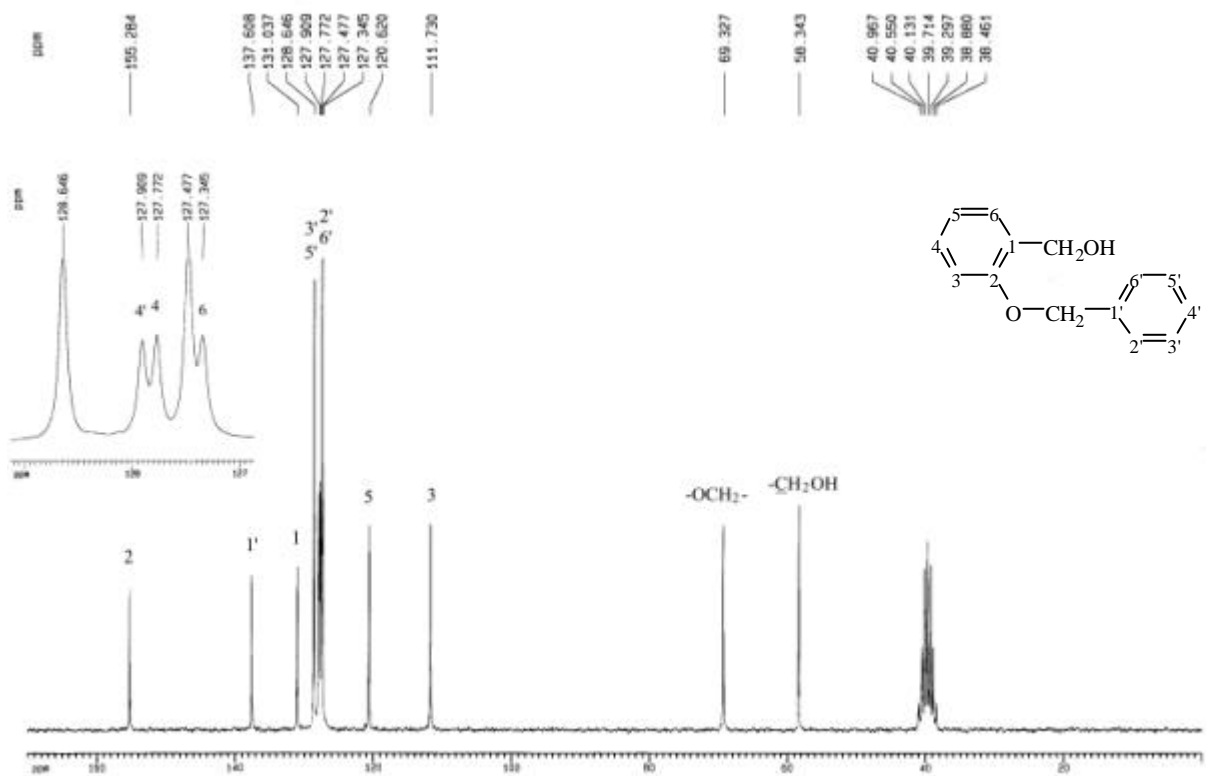


圖 30-4  $^{13}\text{C-NMR}$  (DMSO- $d_6$ , 50 MHz) spectrum of compound 30

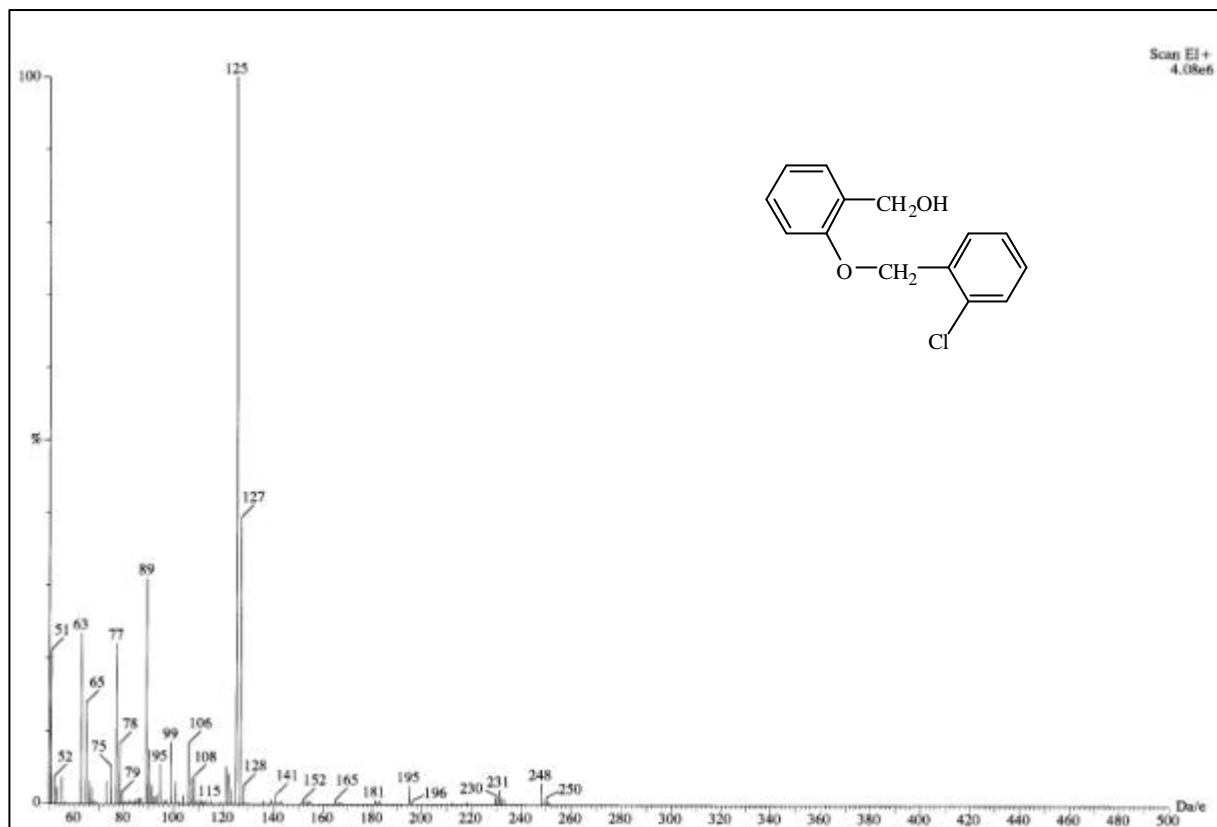


圖 31-1 MS spectrum of compound 31

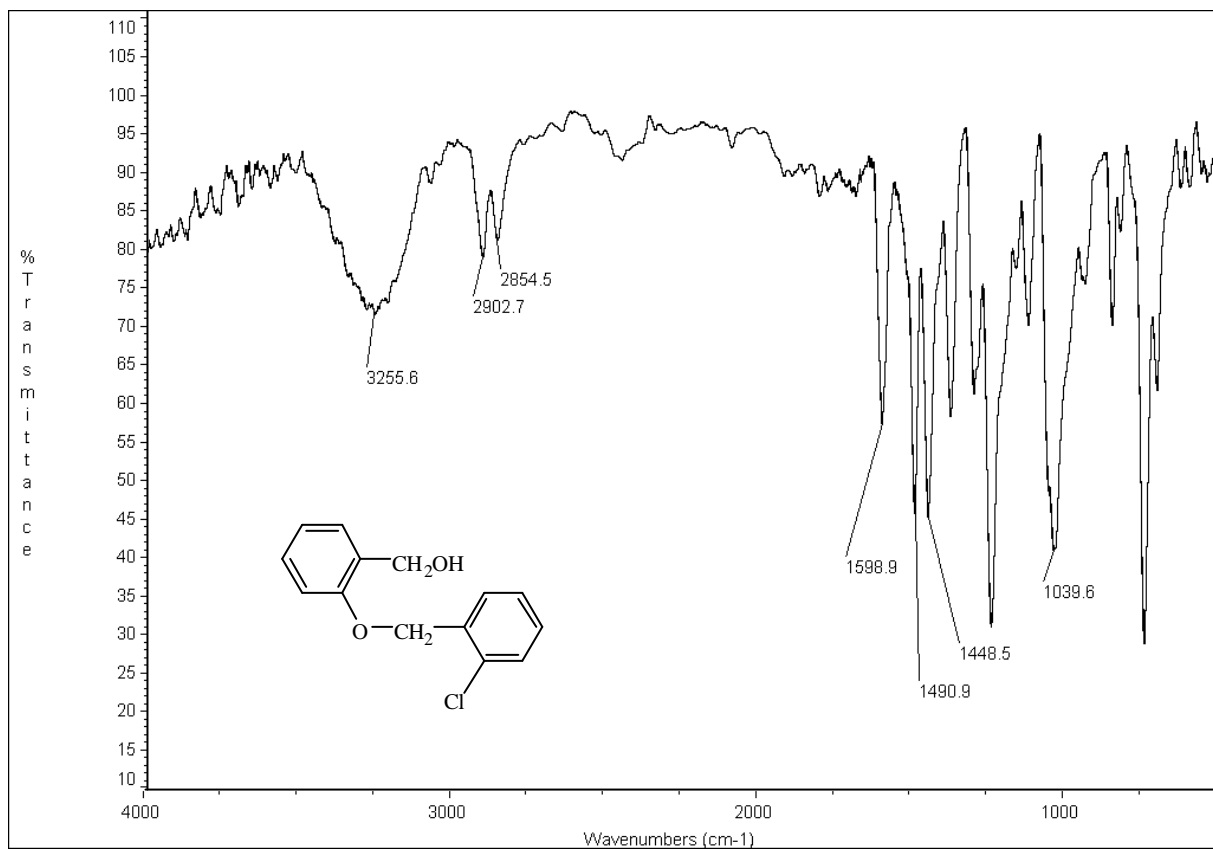


圖 31-2 IR (KBr) spectrum of compound 31

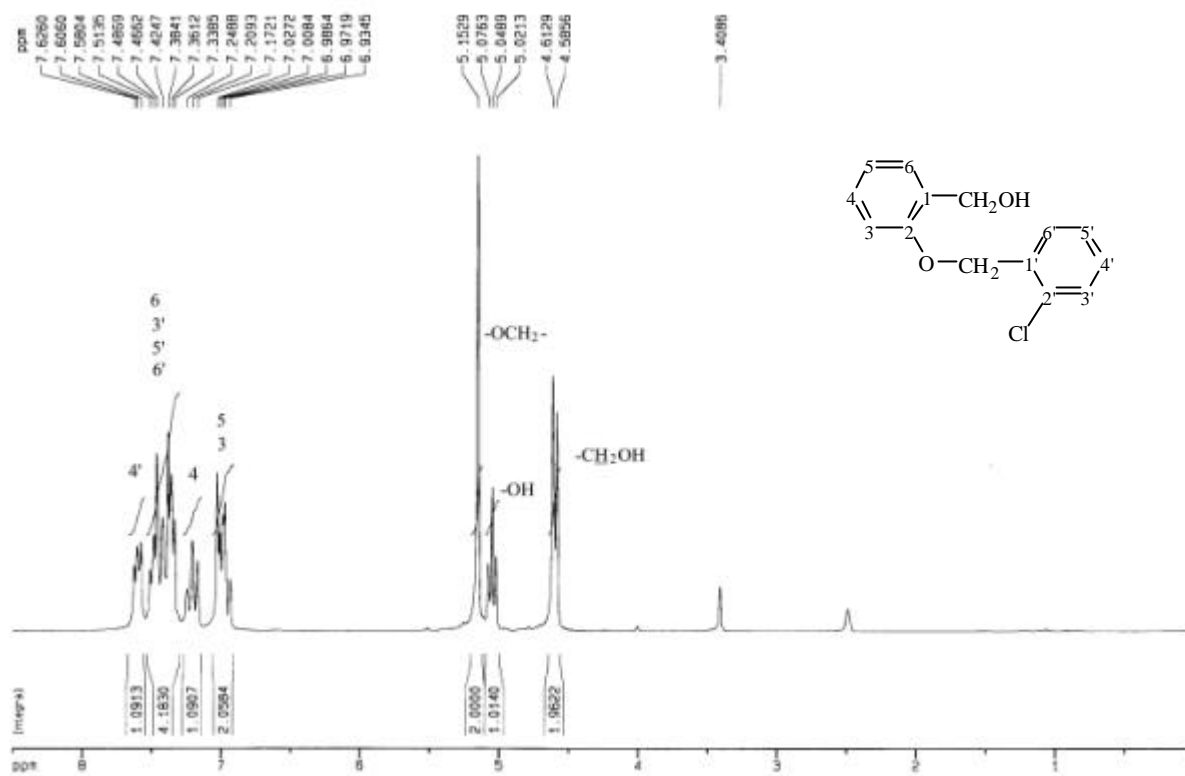


圖 31-3 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound **31**

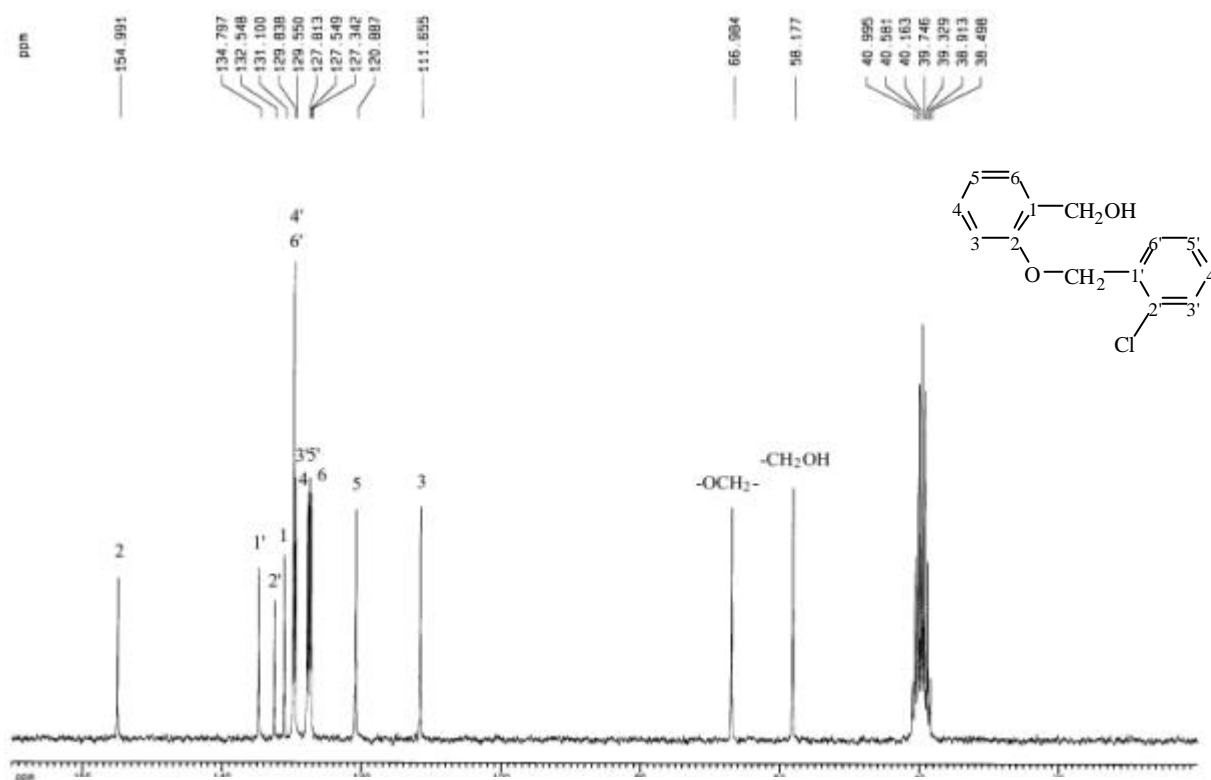


圖 31-4 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound **31**

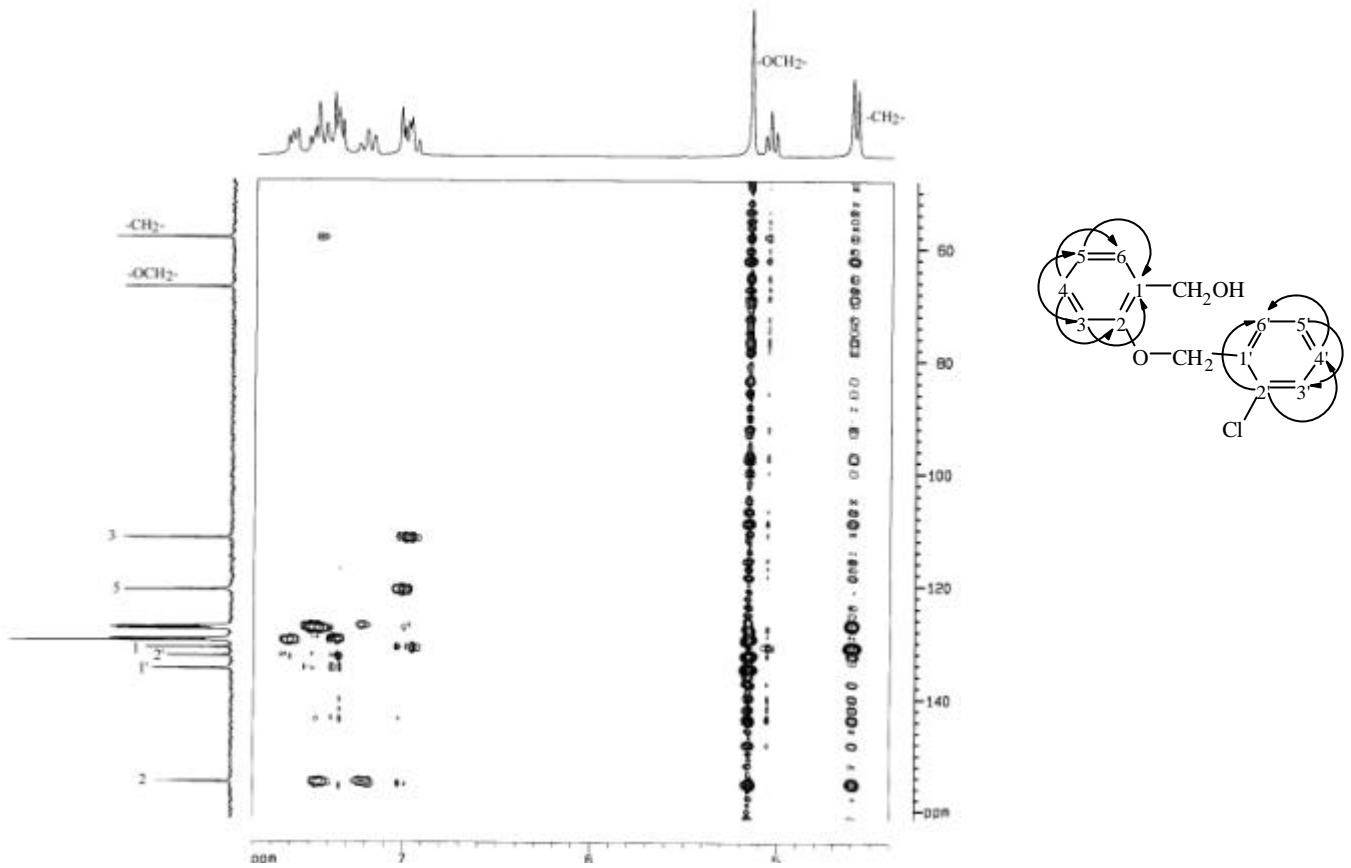


圖 31-5a HMBC (DMSO- $d_6$ ) spectrum of compound **31**

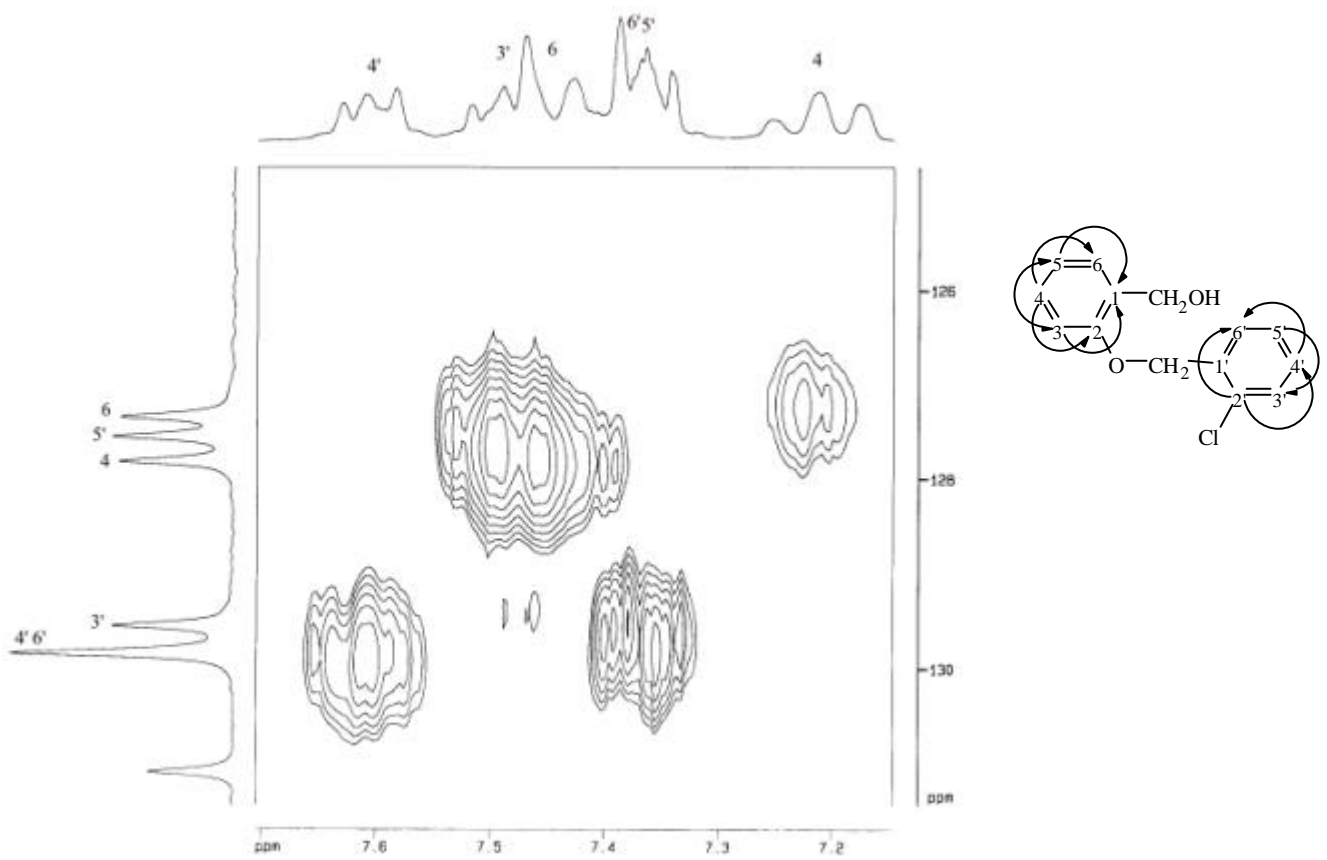


圖 31-5b HMBC (DMSO- $d_6$ ) spectrum of compound **31**

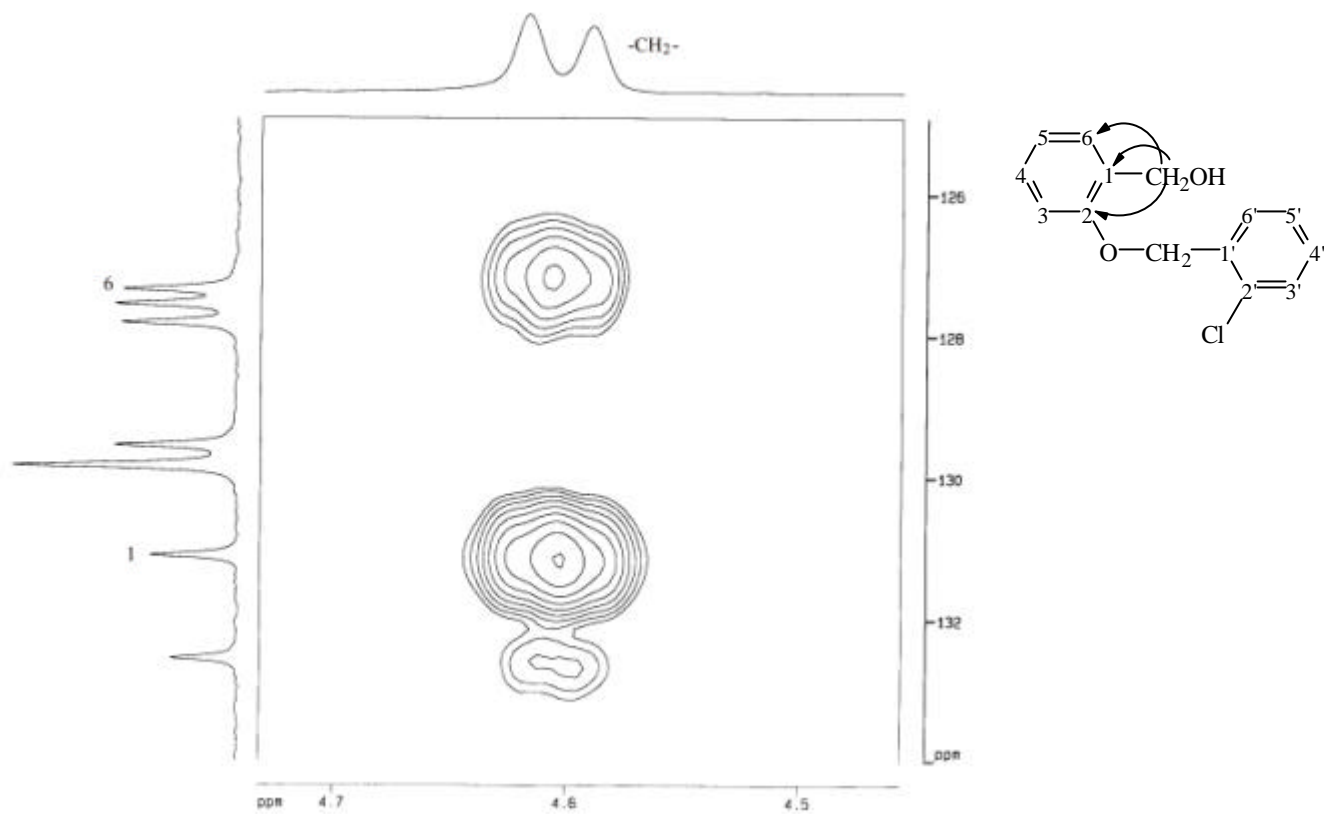


圖 31-5c HMBC (DMSO- $d_6$ ) spectrum of compound **31**

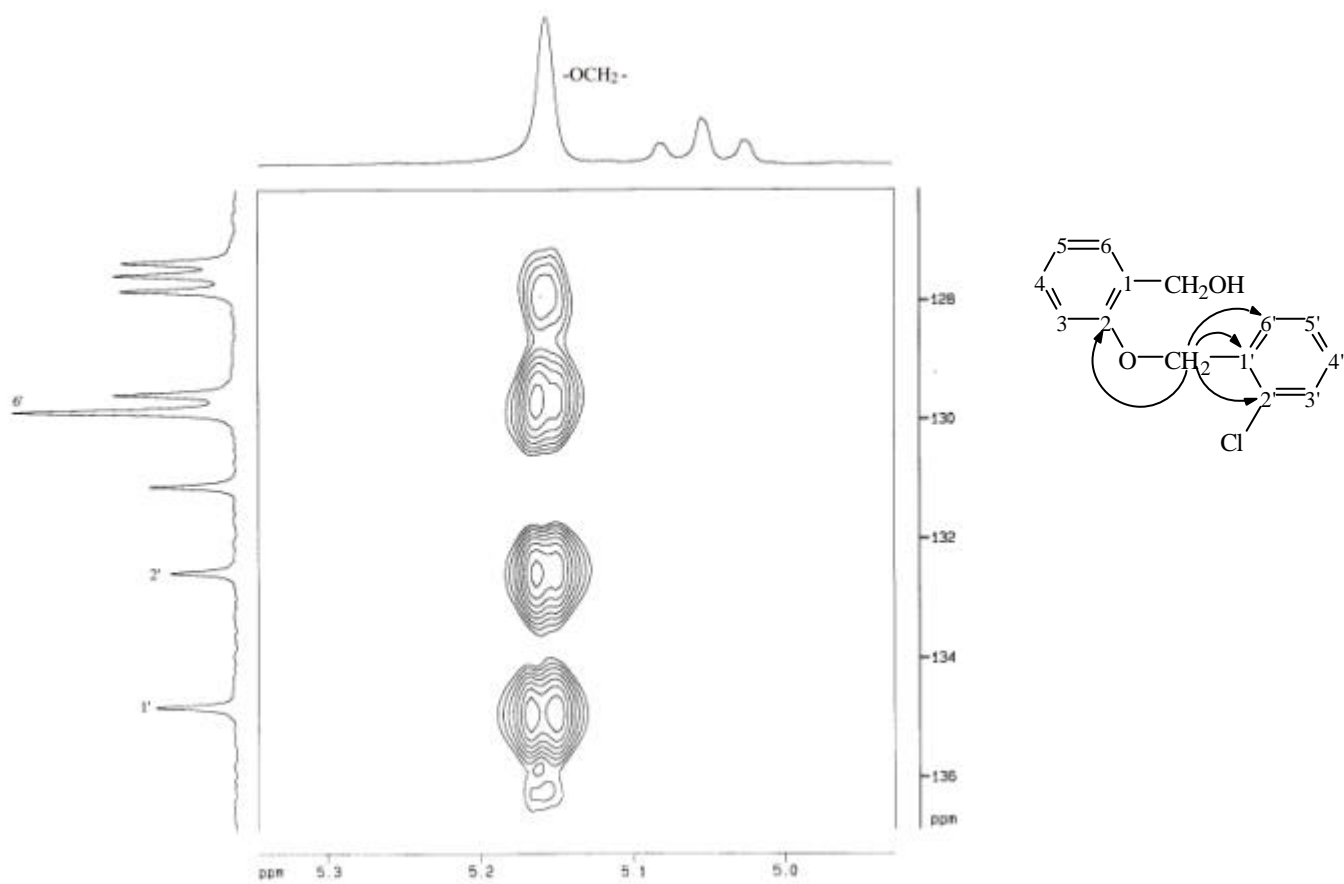


圖 31-5d HMBC (DMSO- $d_6$ ) spectrum of compound **31**



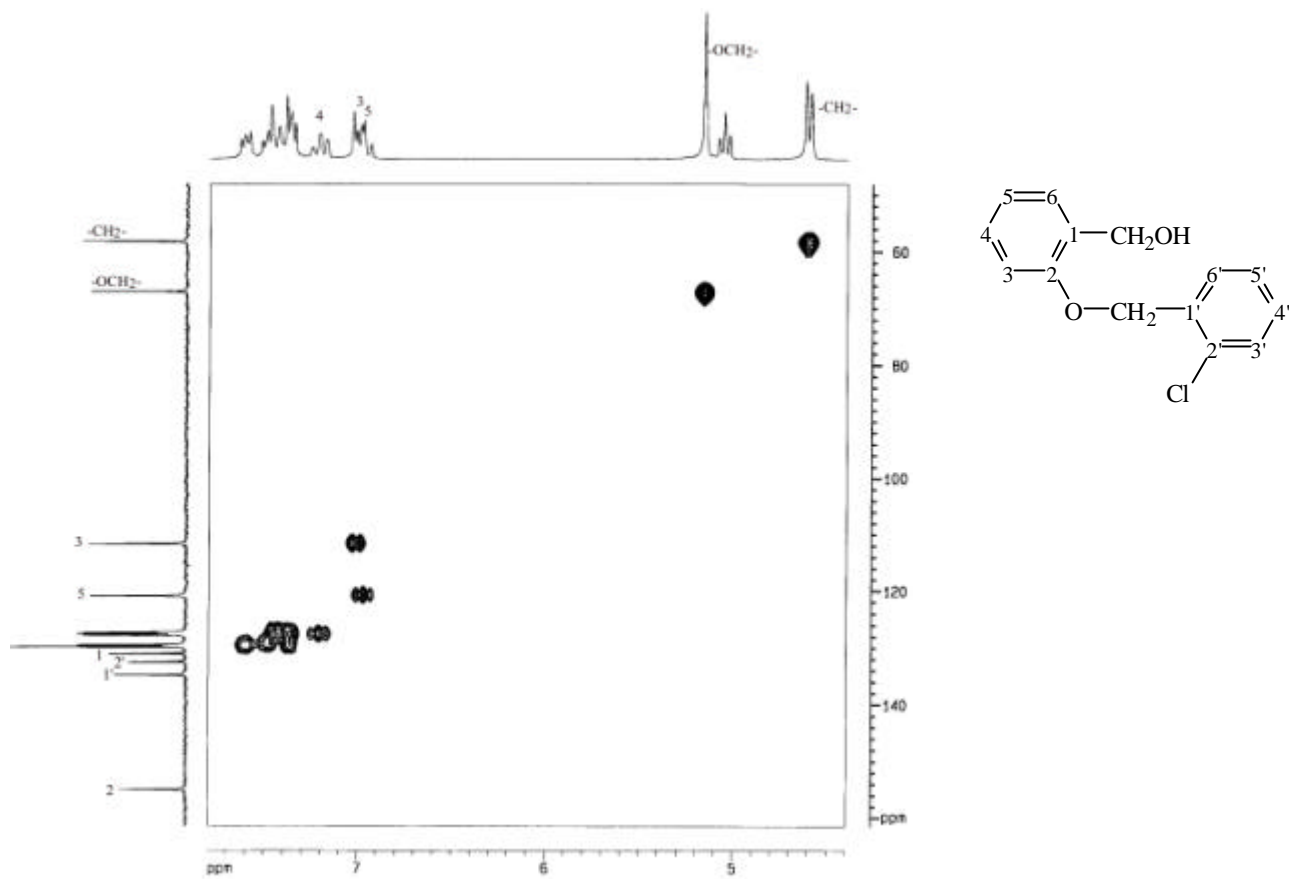


圖 31-6a HMQC (DMSO- $d_6$ ) spectrum of compound **31**

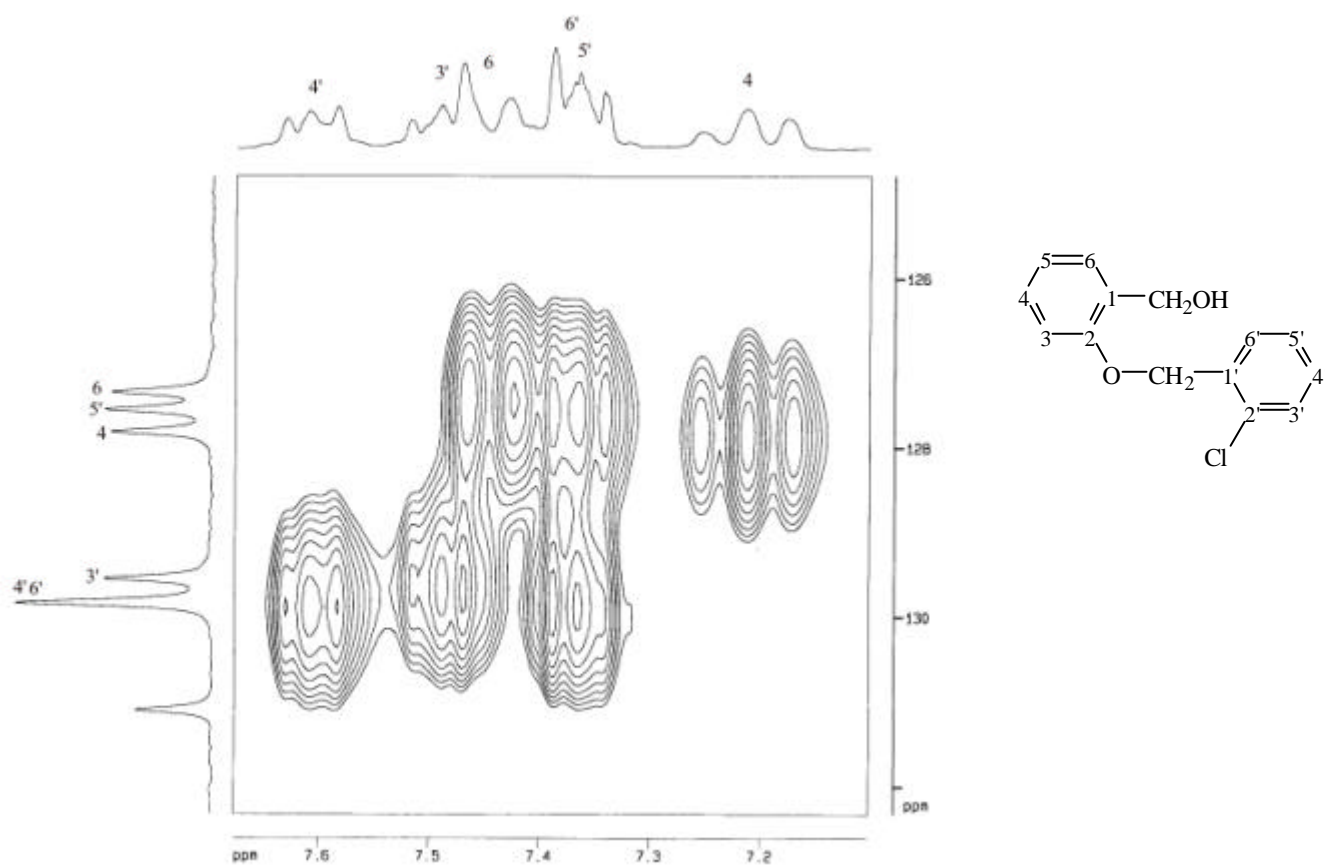


圖 31-6b HMQC (DMSO- $d_6$ ) spectrum of compound **31**

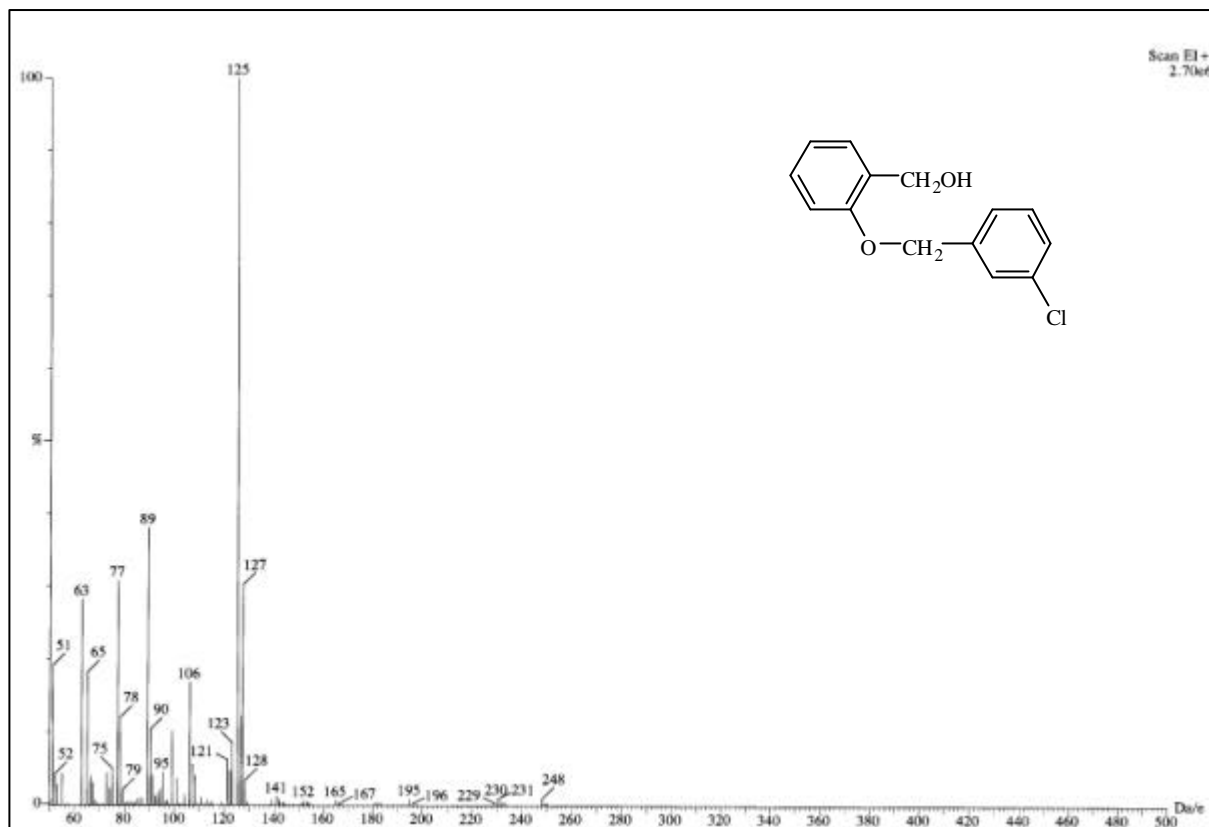


圖 32-1 MS spectrum of compound 32

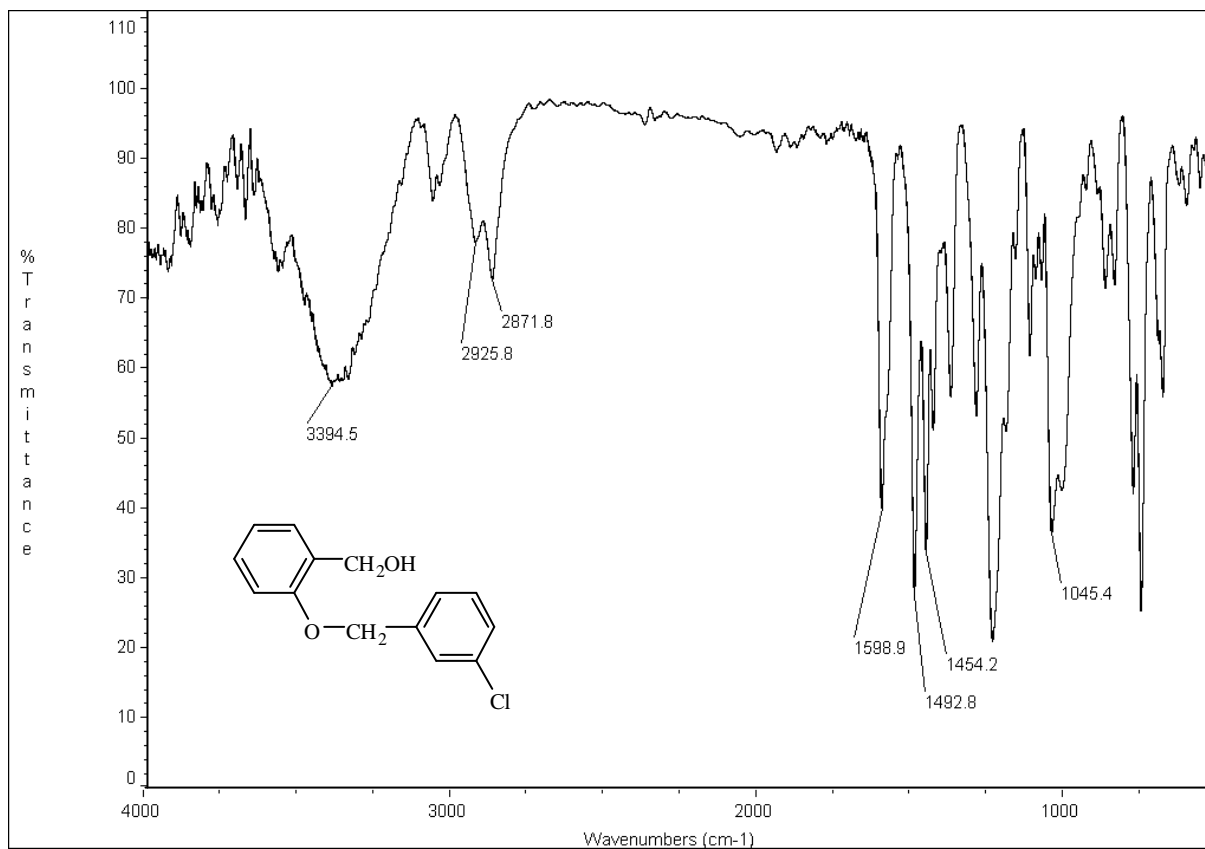


圖 32-2 IR (KBr) spectrum of compound 32

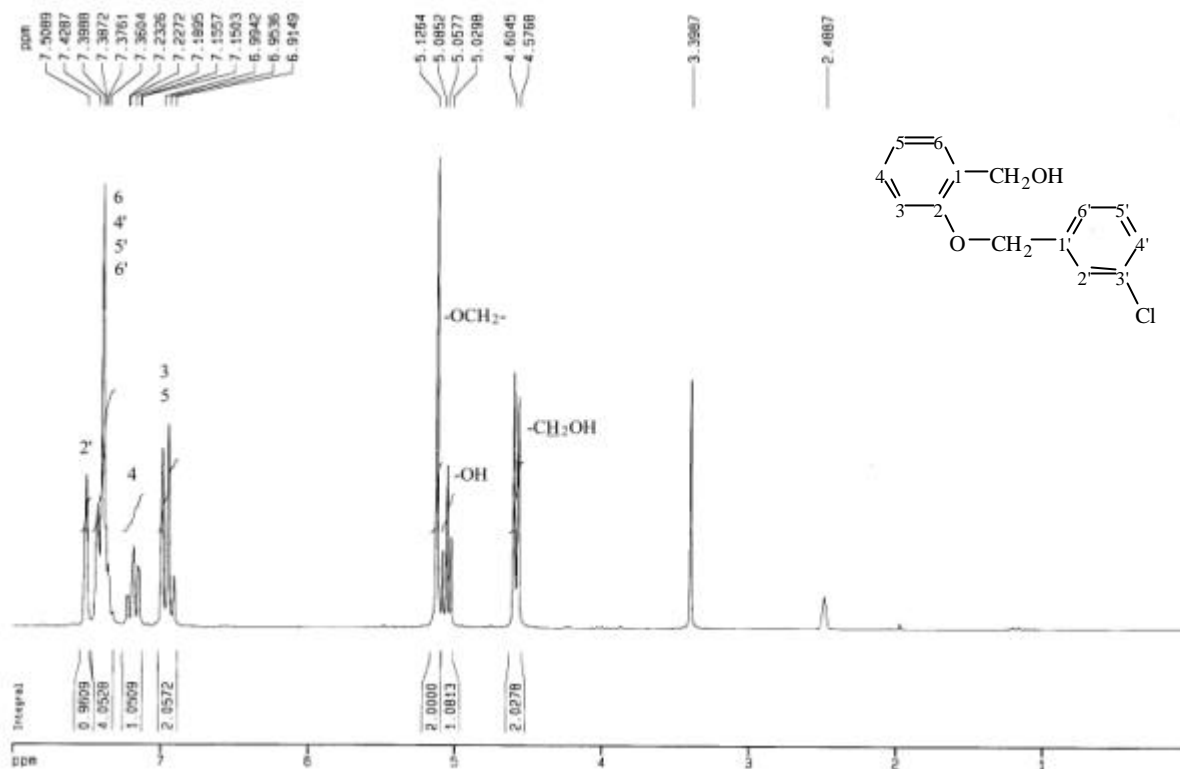


圖 32-3 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound **32**

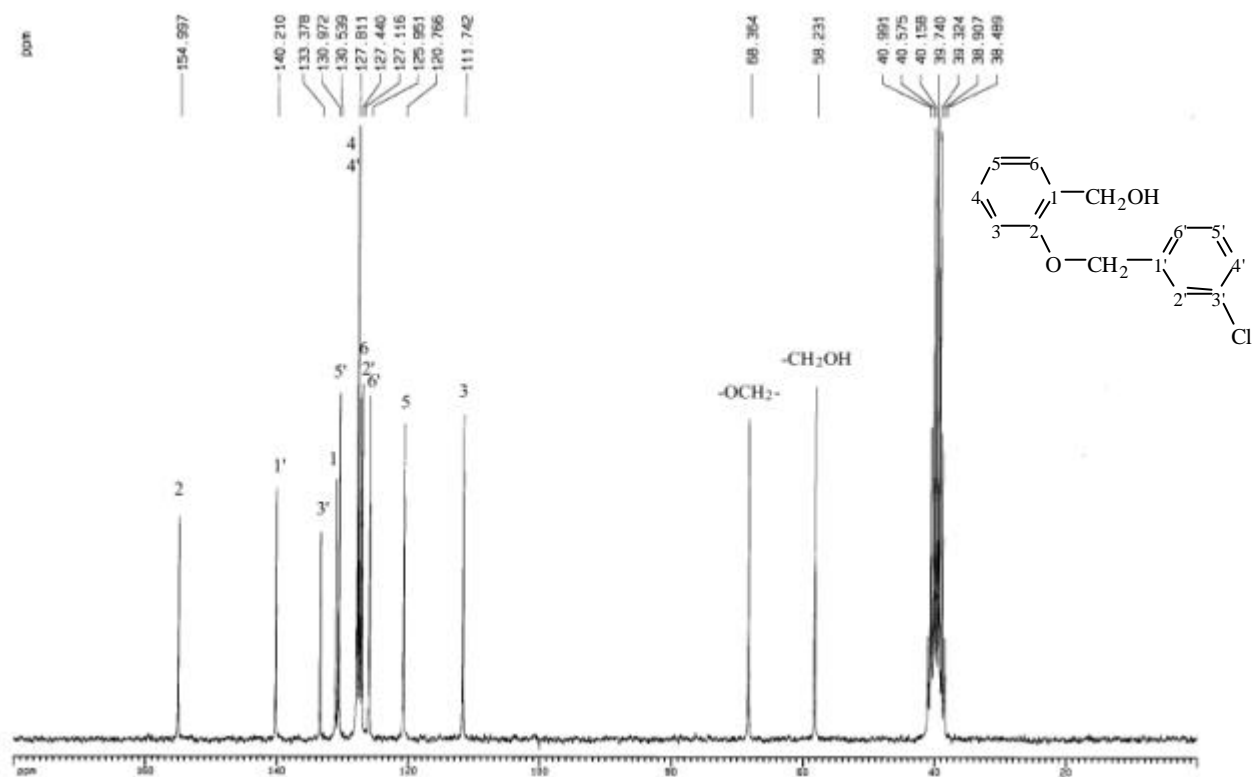


圖 32-4 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound **32**

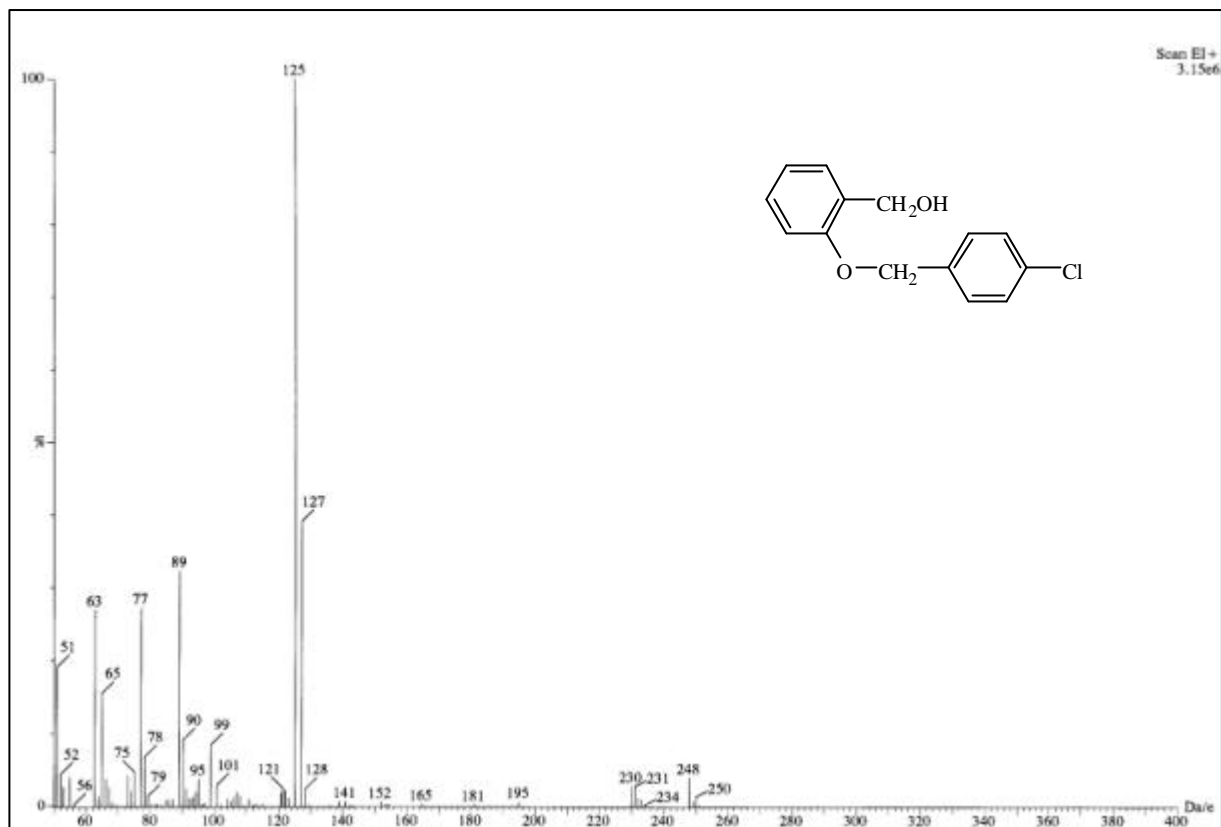


圖 33-1 MS spectrum of compound 33

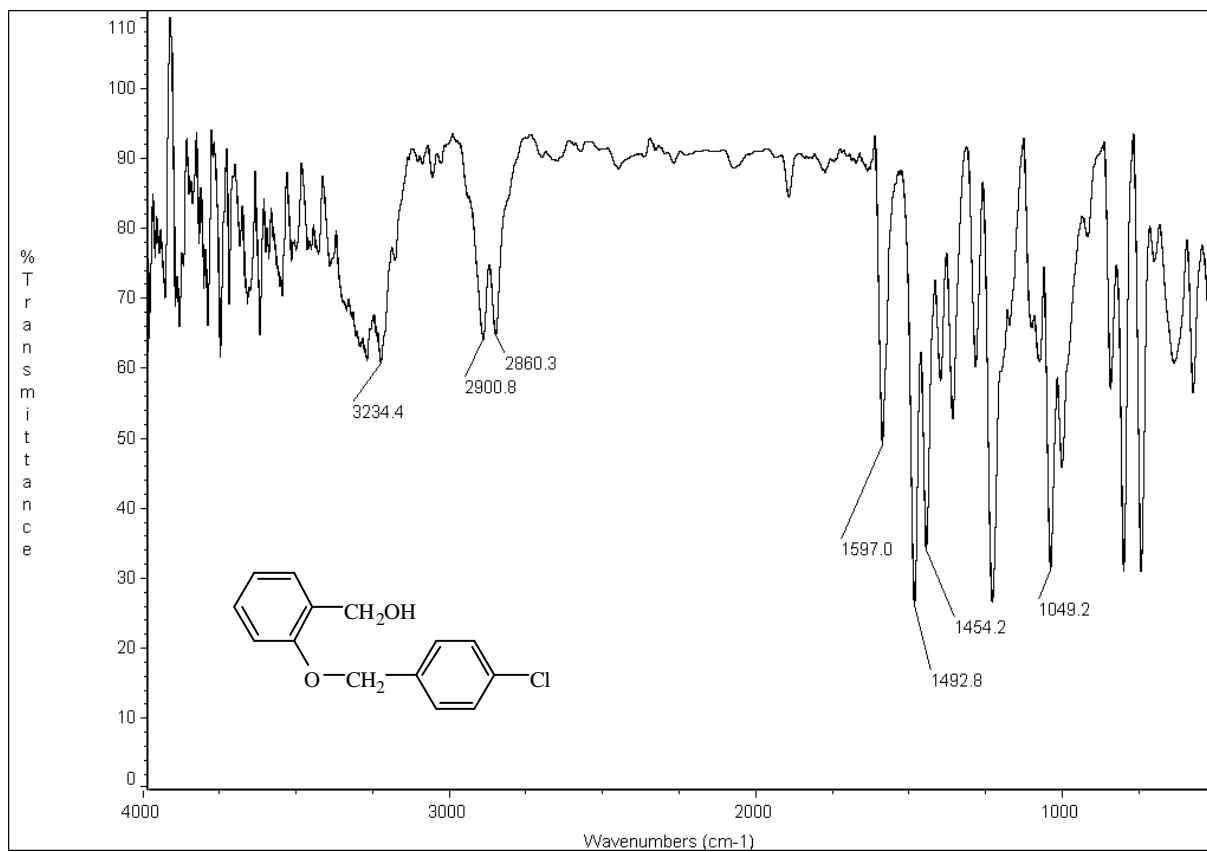


圖 33-2 IR (KBr) spectrum of compound 33

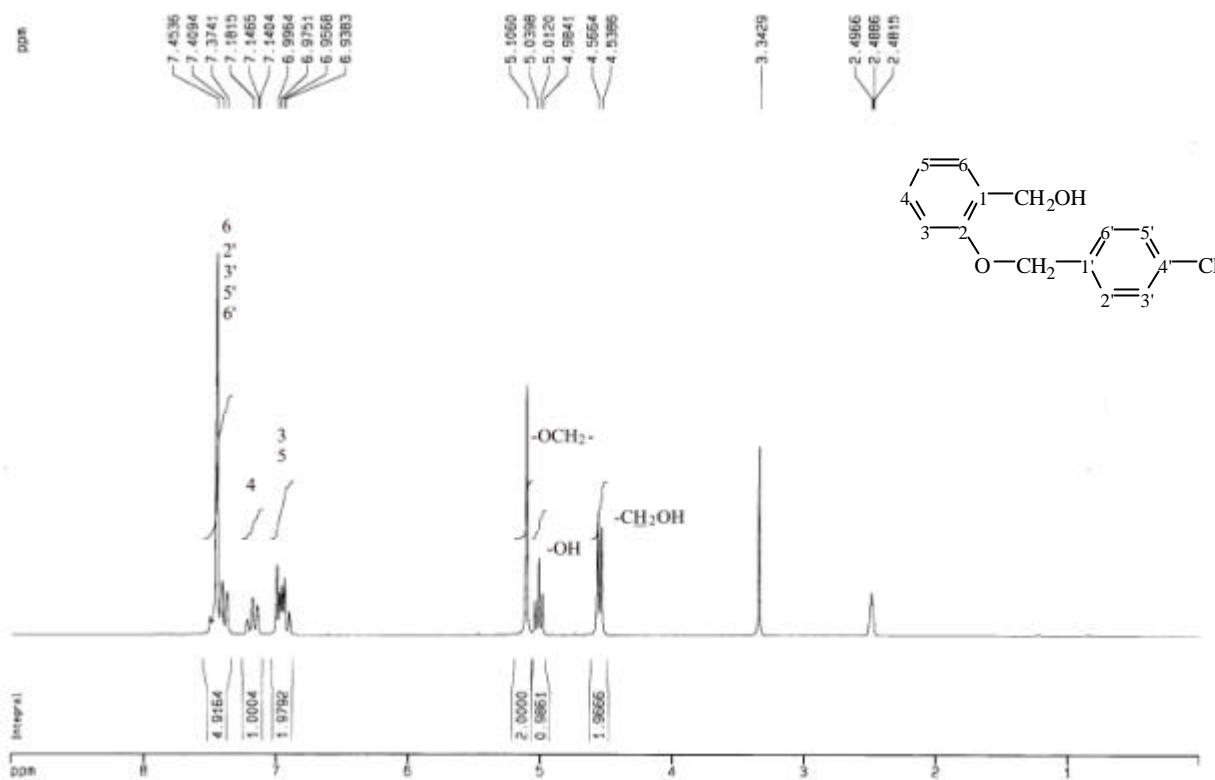


圖 33-3 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound **33**

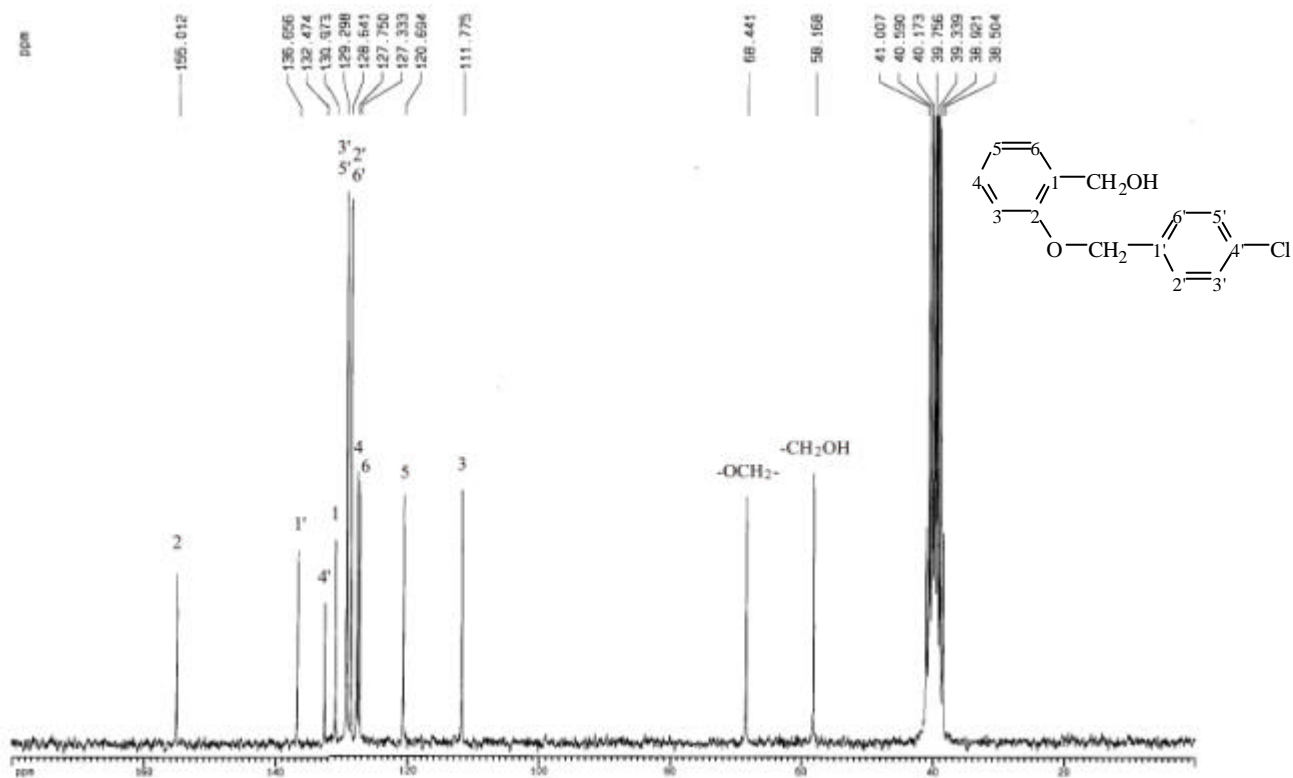


圖 33-4 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound **33**

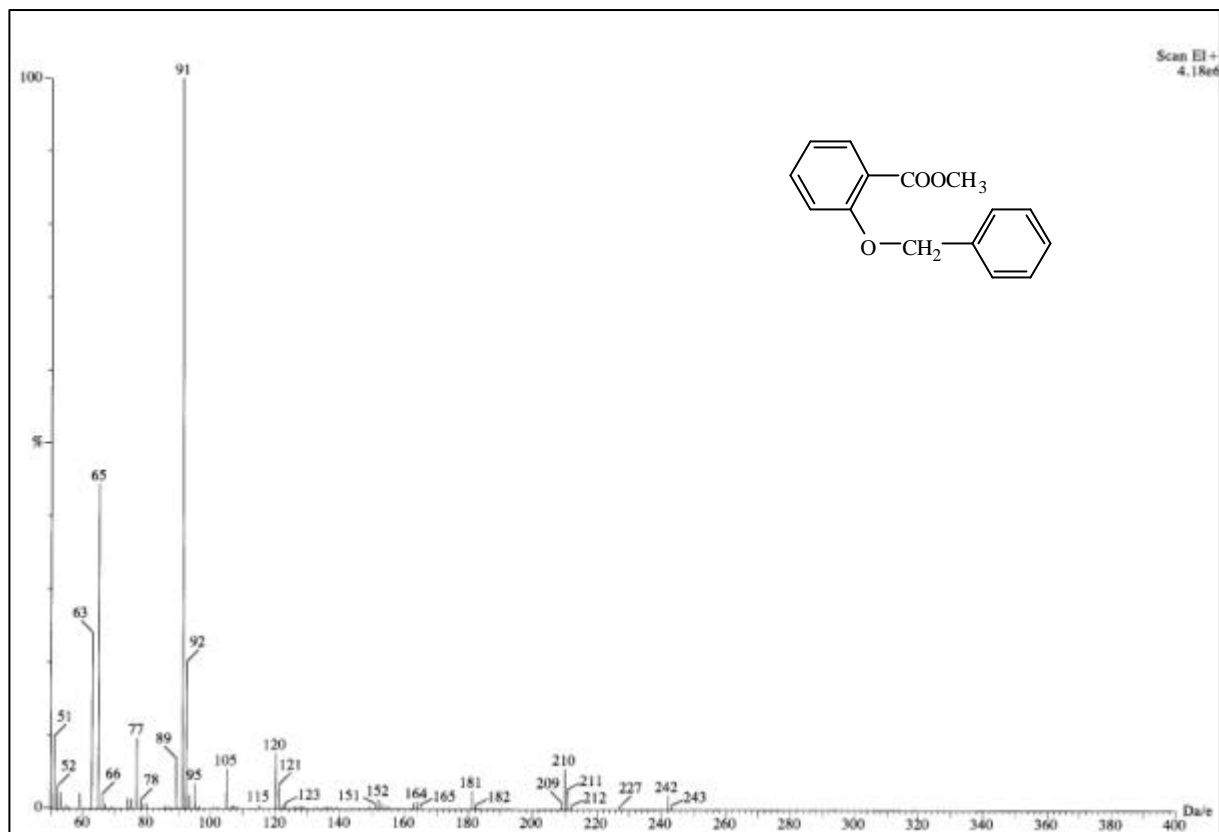


圖 34-1 MS spectrum of compound 34

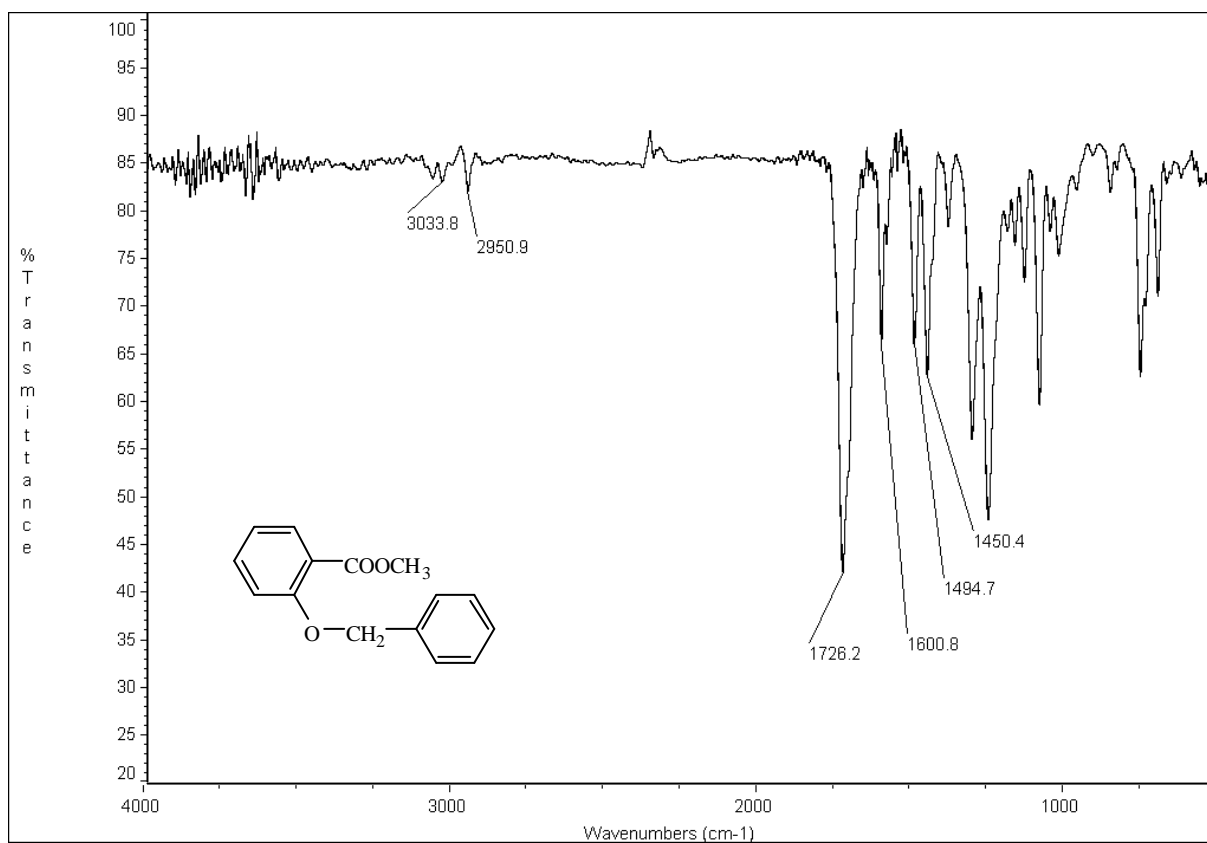


圖 34-2 IR (KBr) spectrum of compound 34

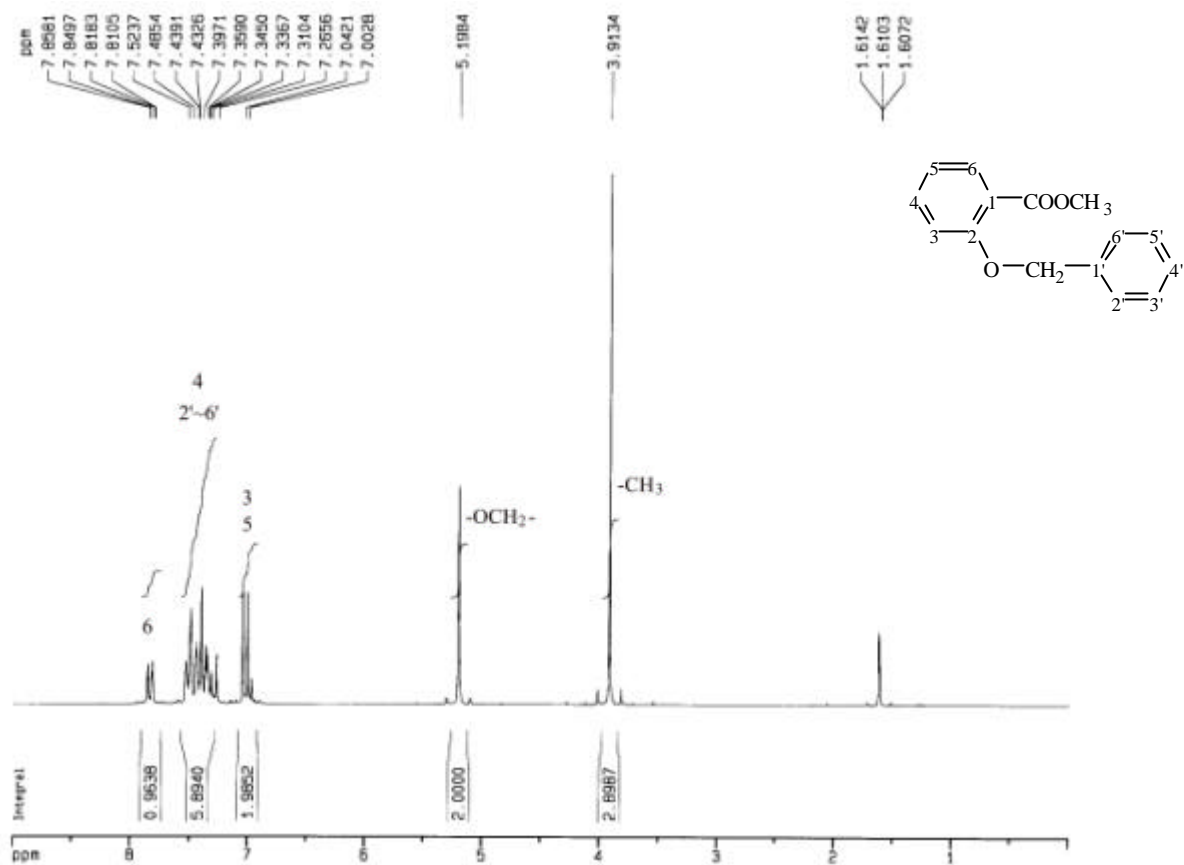


圖 34-3 <sup>1</sup>H-NMR (CDCl<sub>3</sub>, 200 MHz) spectrum of compound **34**

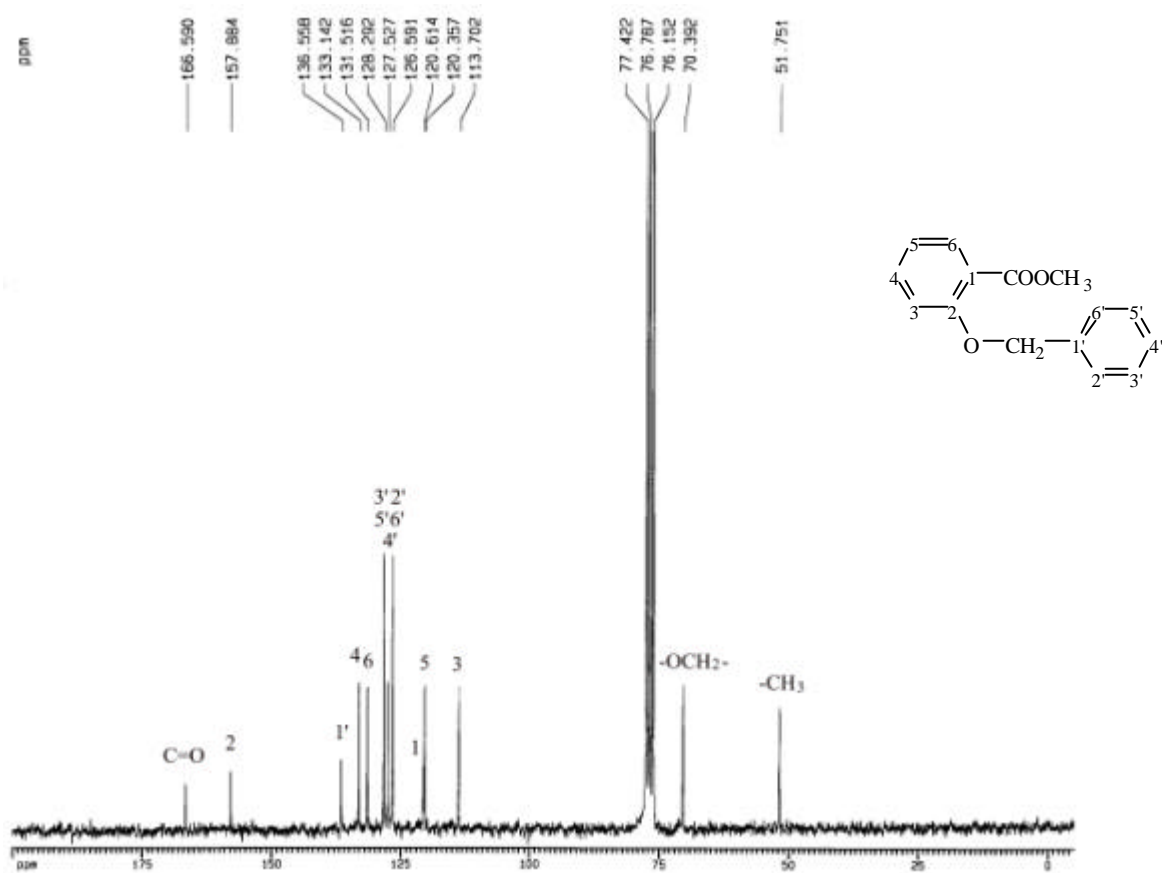


圖 34-4 <sup>13</sup>C-NMR (CDCl<sub>3</sub>, 50 MHz) spectrum of compound **34**

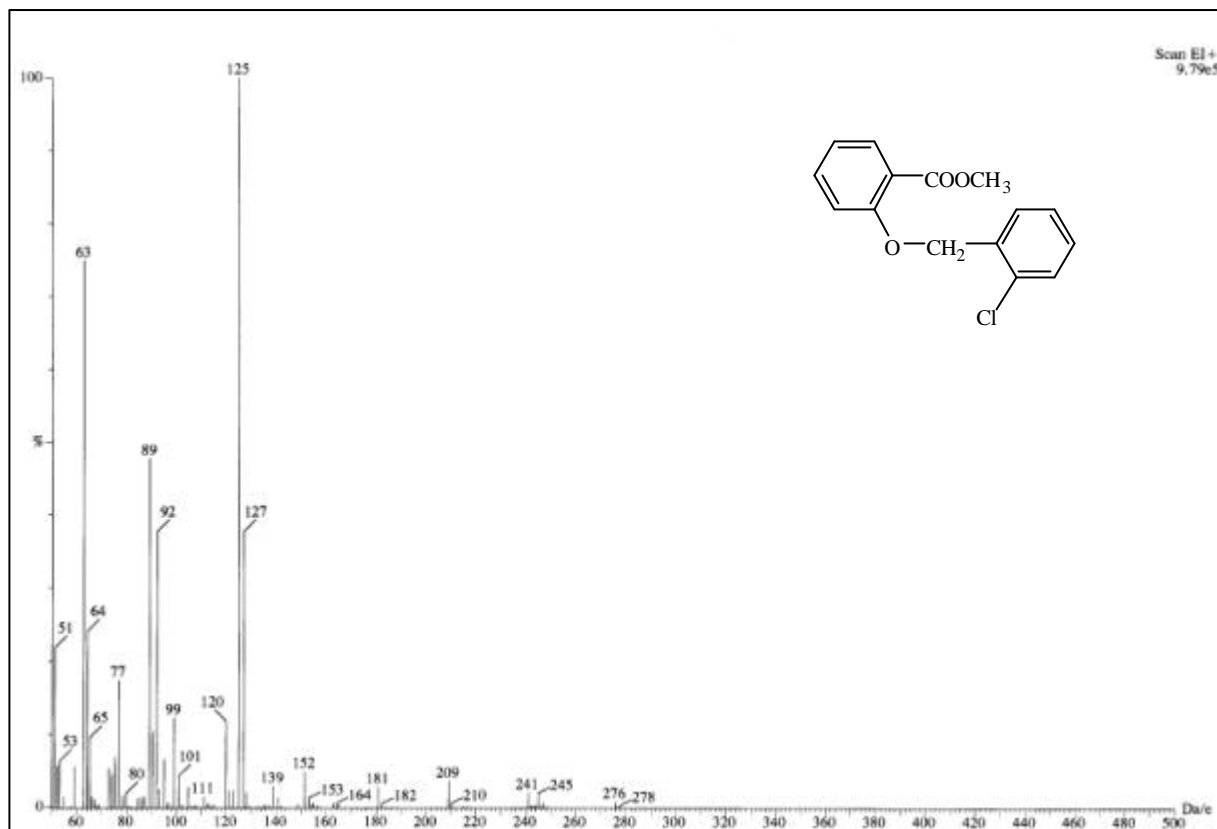


圖 35-1 MS spectrum of compound 35

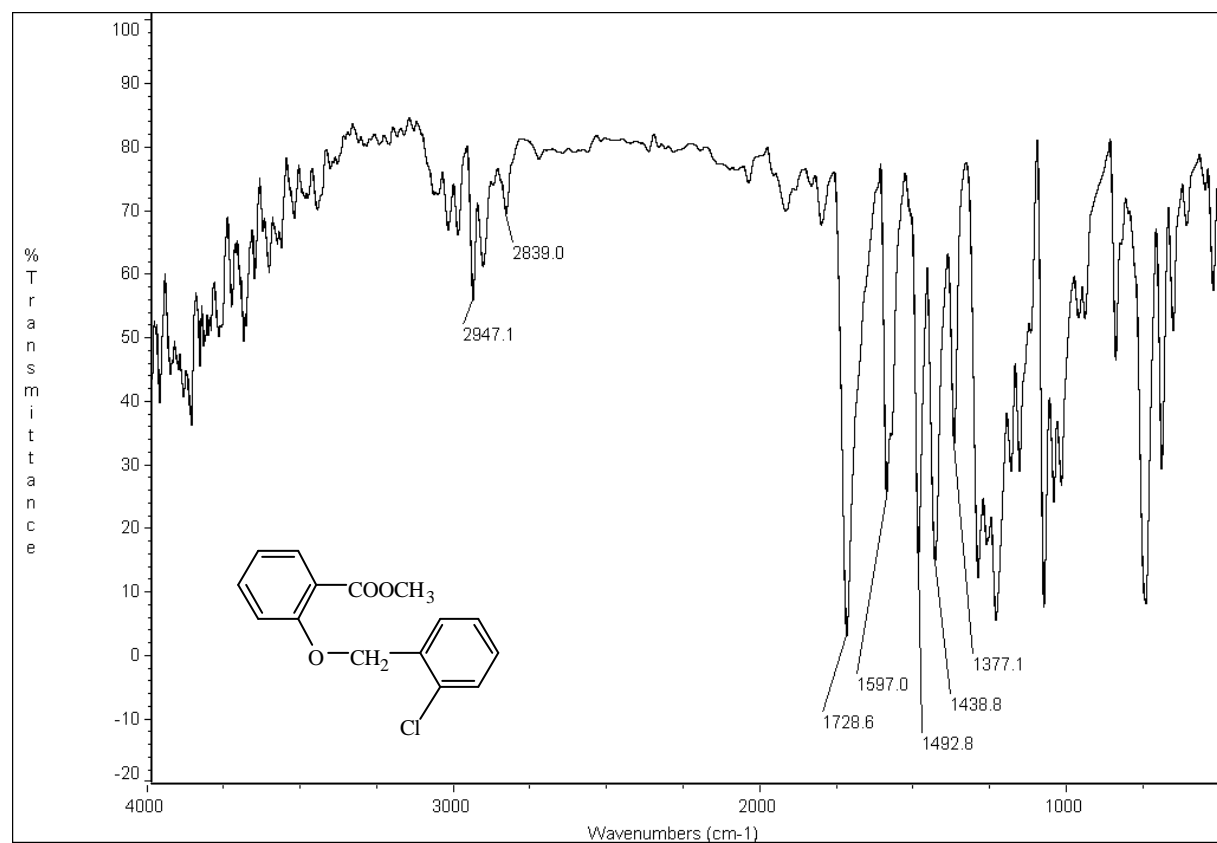


圖 35-2 IR (KBr) spectrum of compound 35



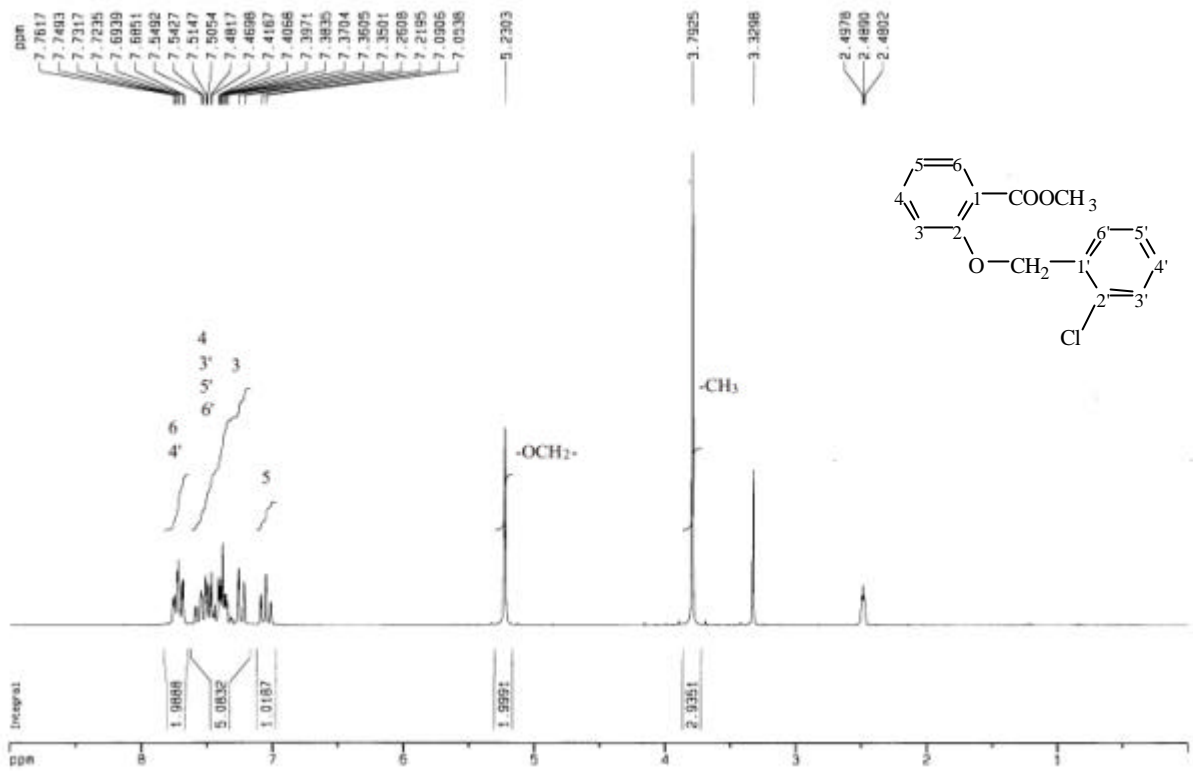


圖 35-3 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound **35**

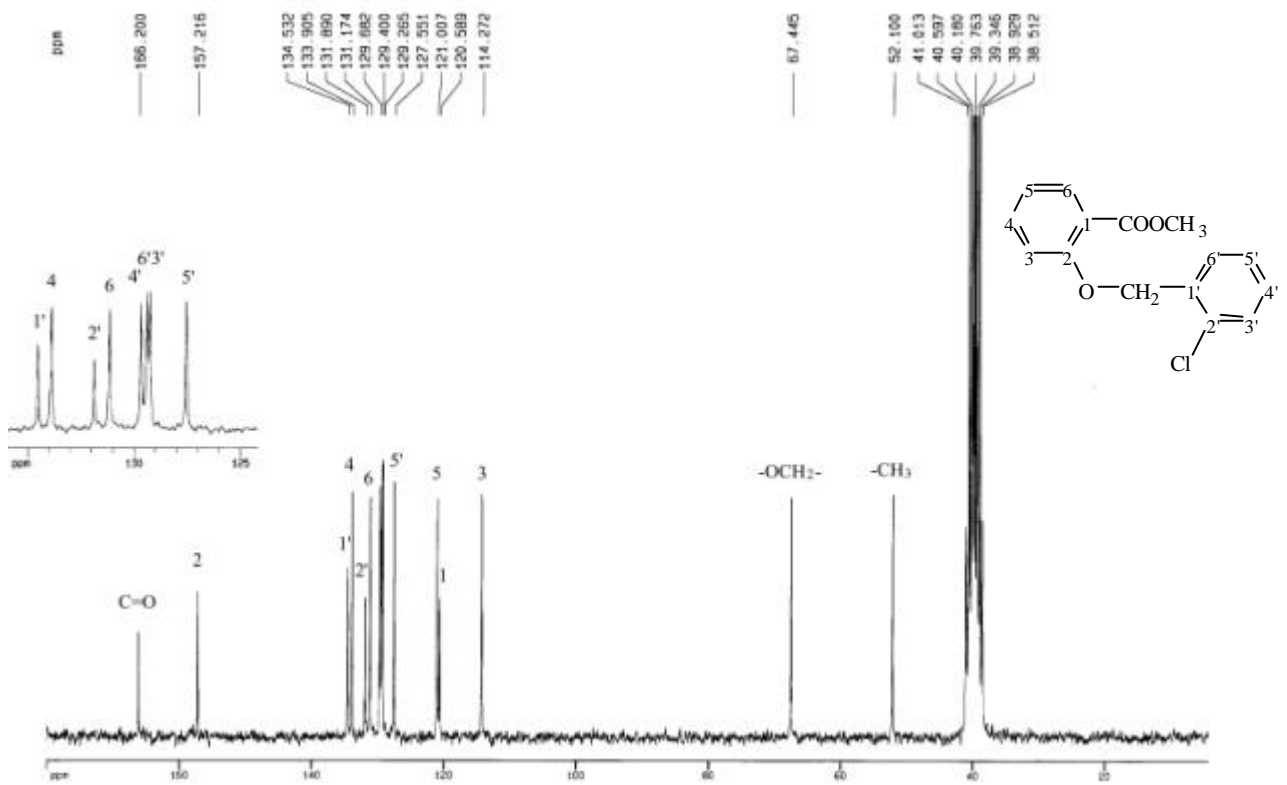


圖 35-4 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound **35**

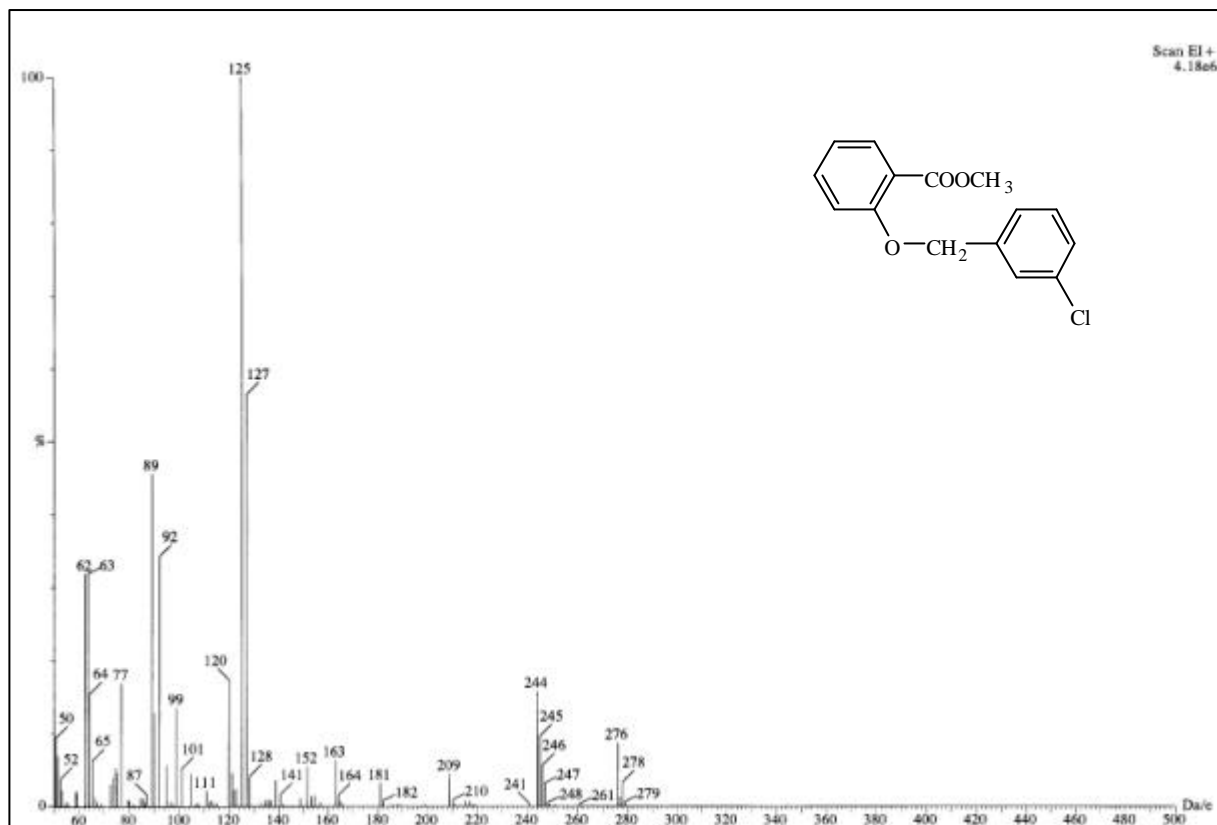


圖 36-1 MS spectrum of compound 36

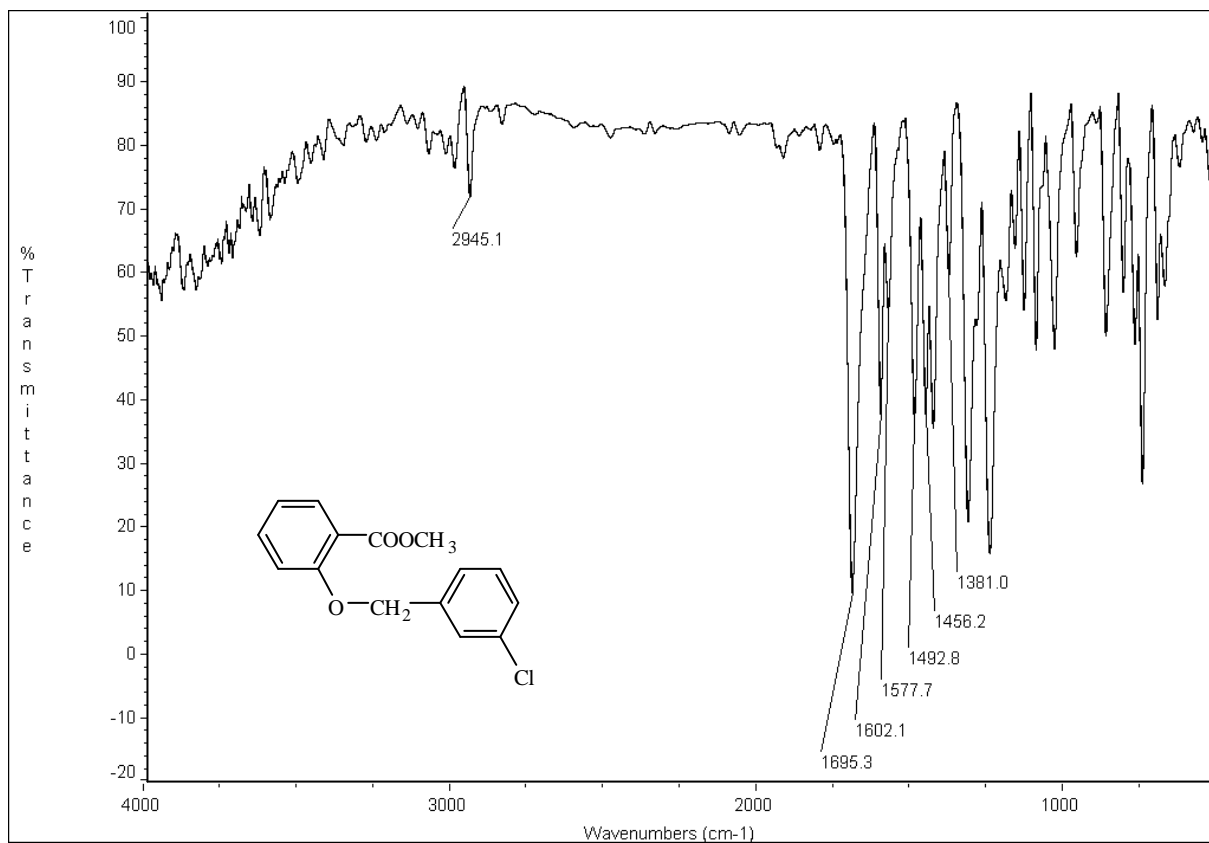


圖 36-2 IR (KBr) spectrum of compound 36

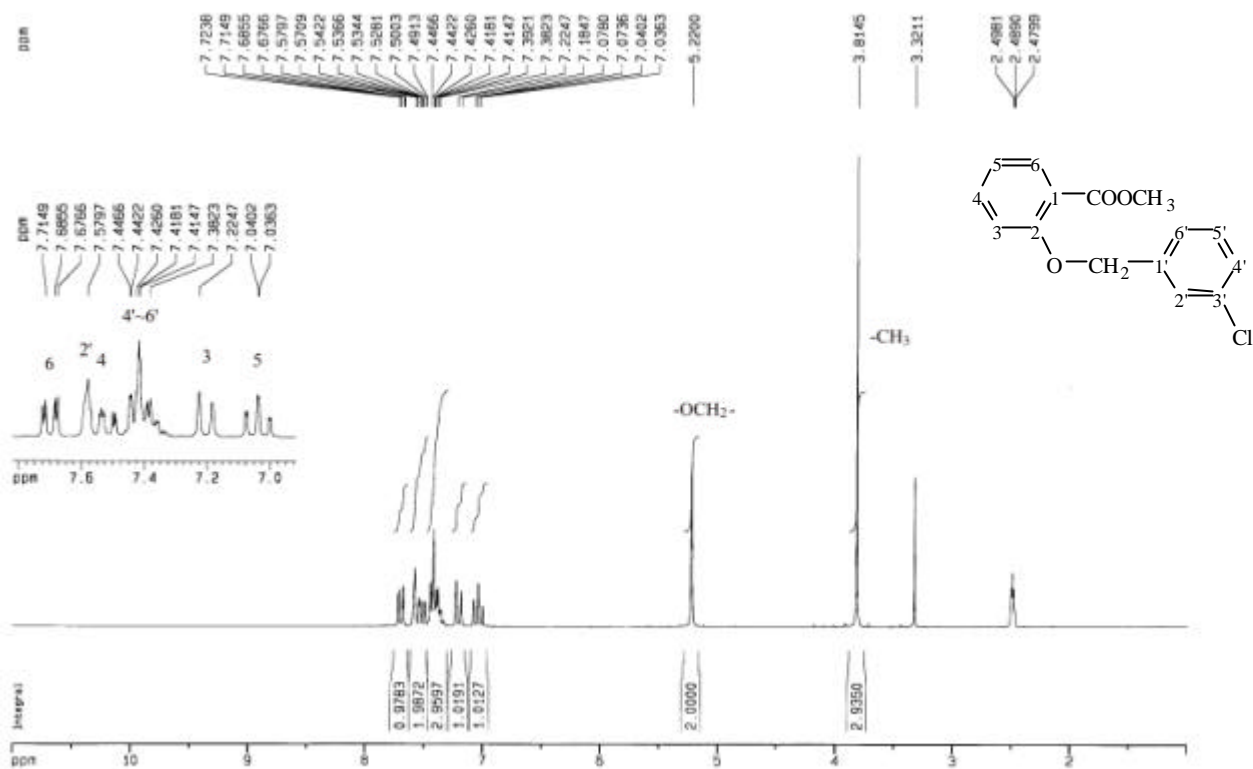


圖 36-3 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound **36**

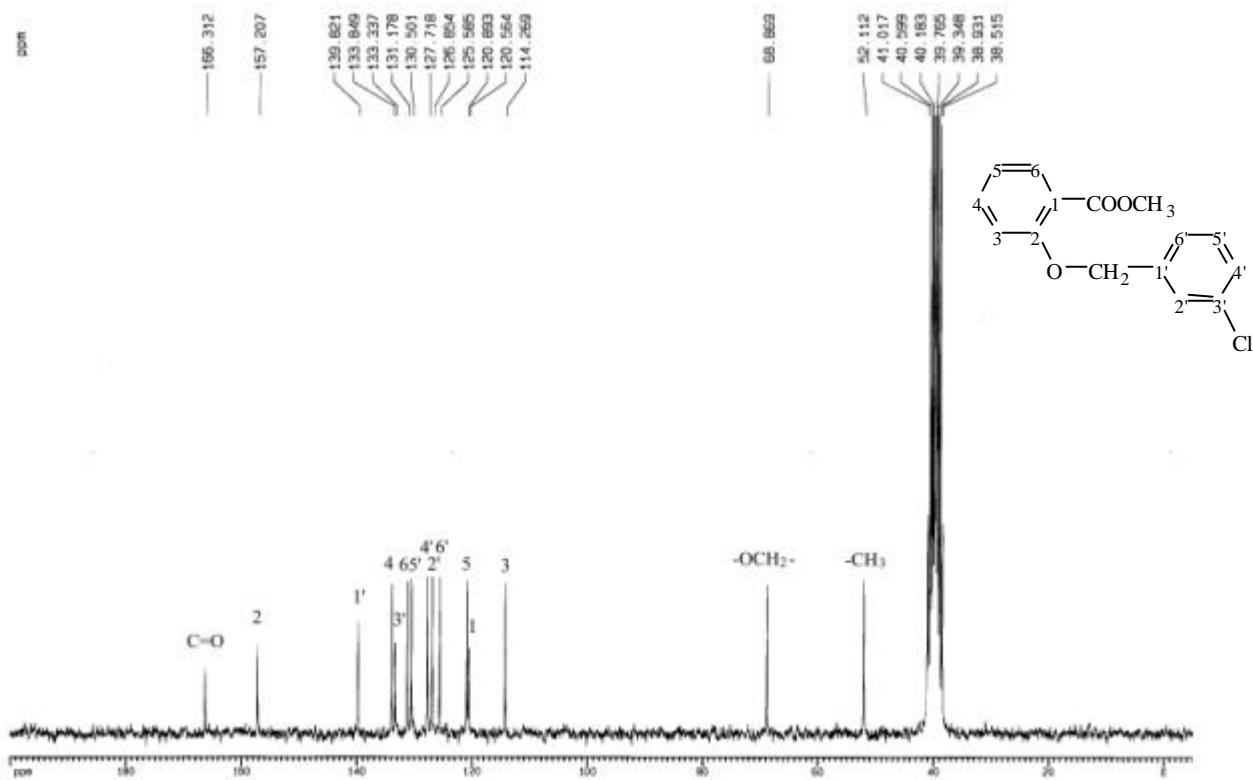


圖 36-4 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound **36**

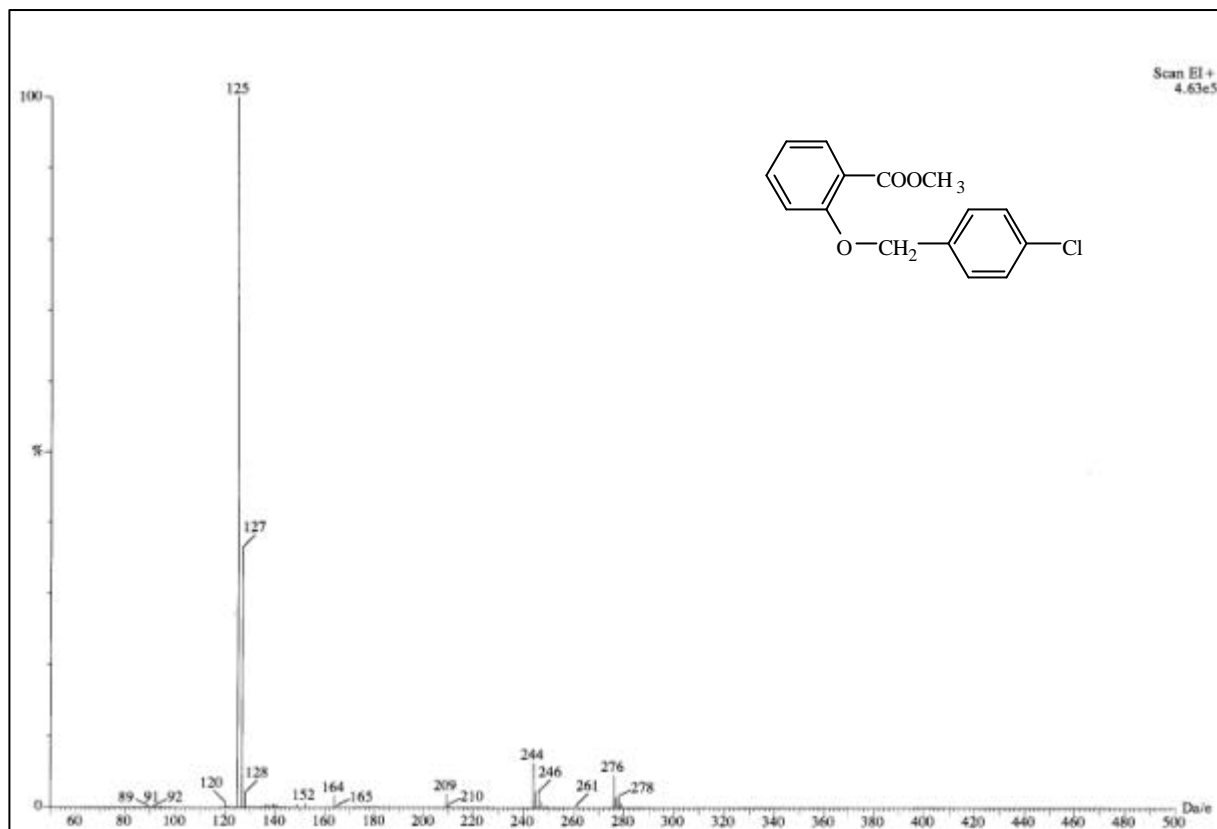


圖 37-1 MS spectrum of compound 37

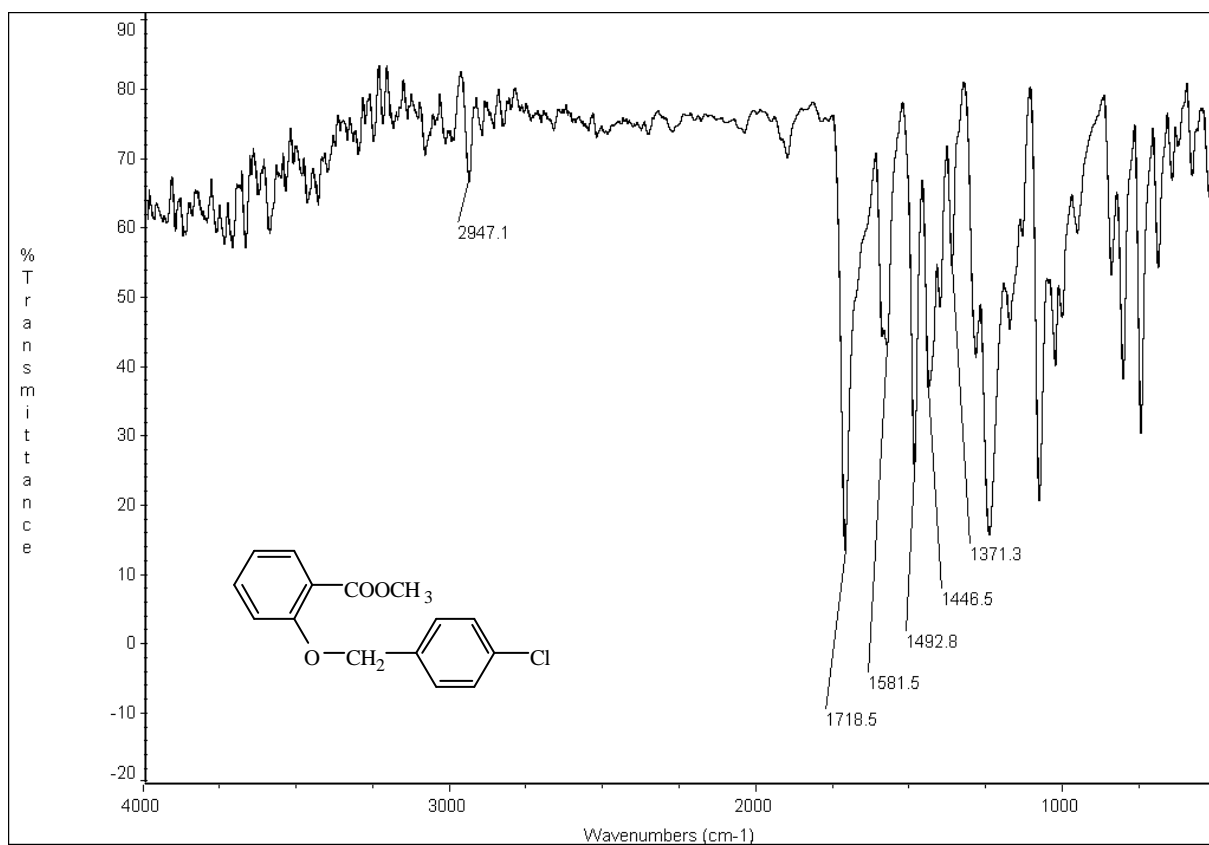


圖 37-2 IR (KBr) spectrum of compound 37

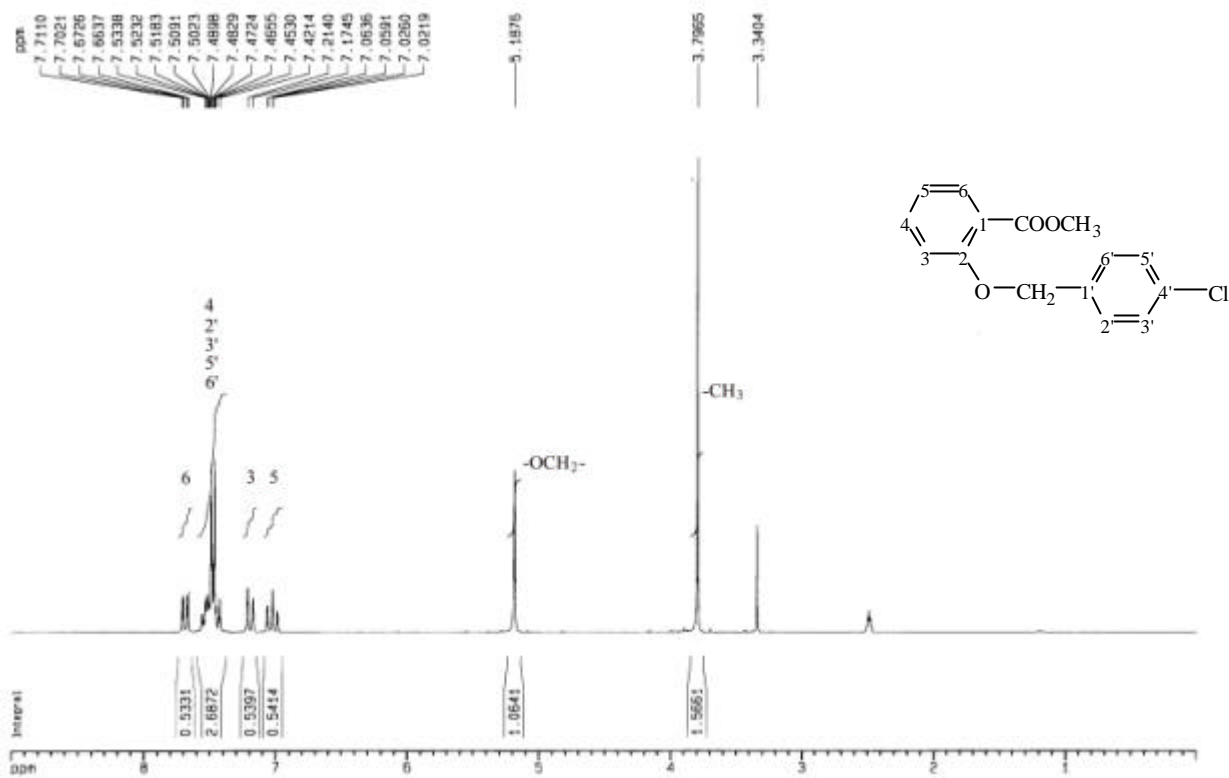


圖 37-3 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound **37**

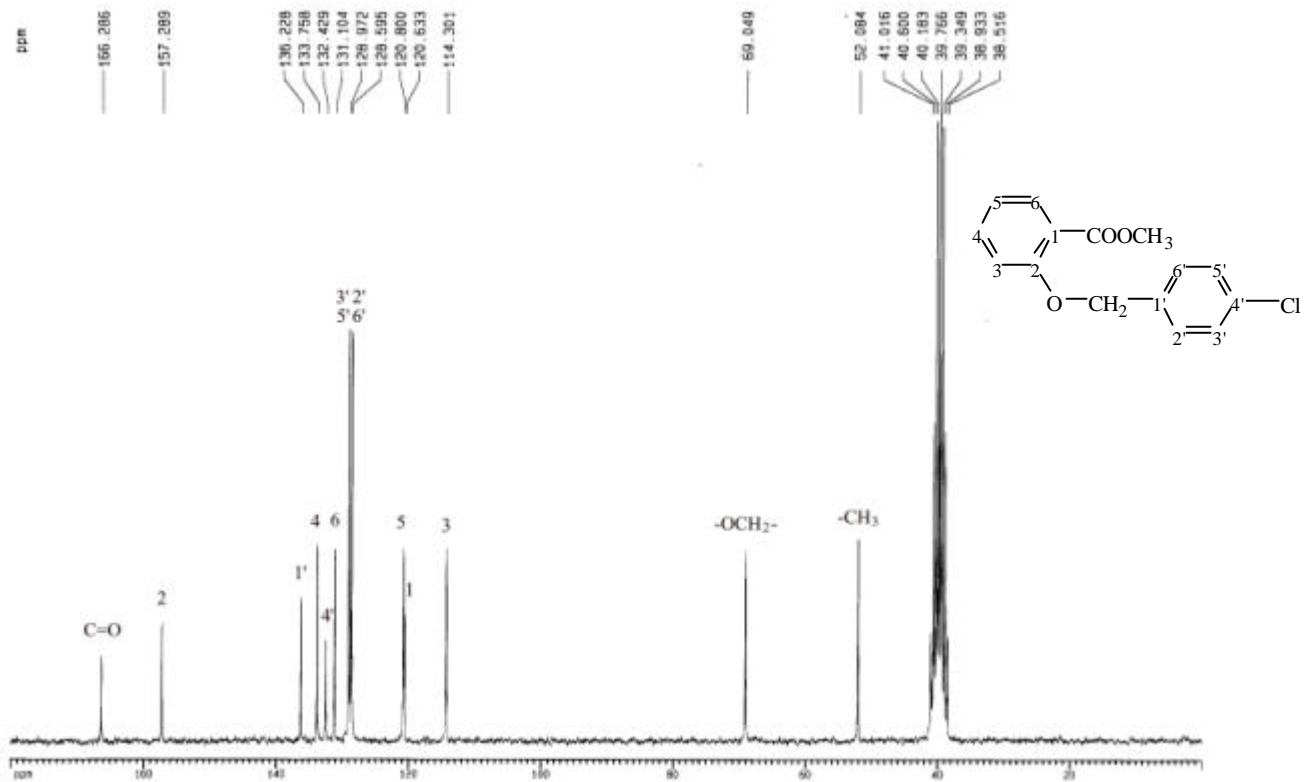


圖 37-4 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound **37**

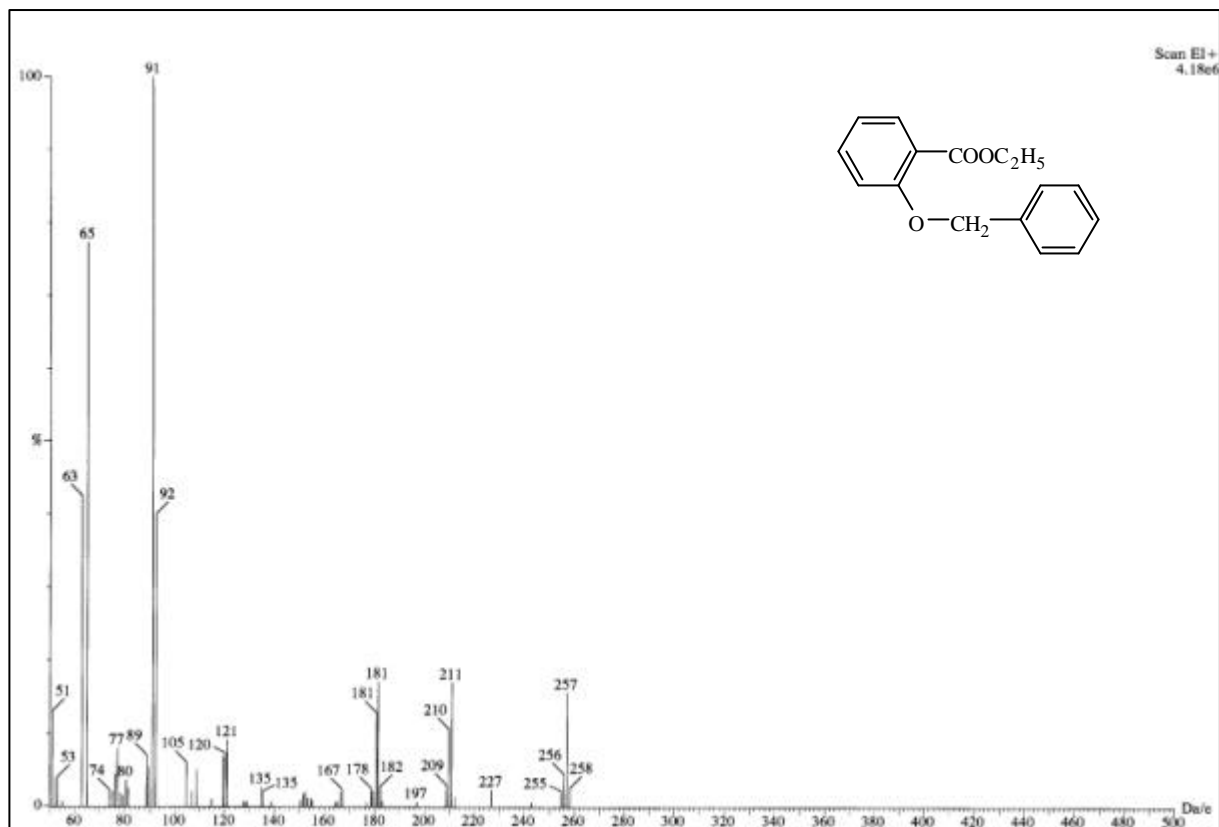


圖 38-1 MS spectrum of compound 38

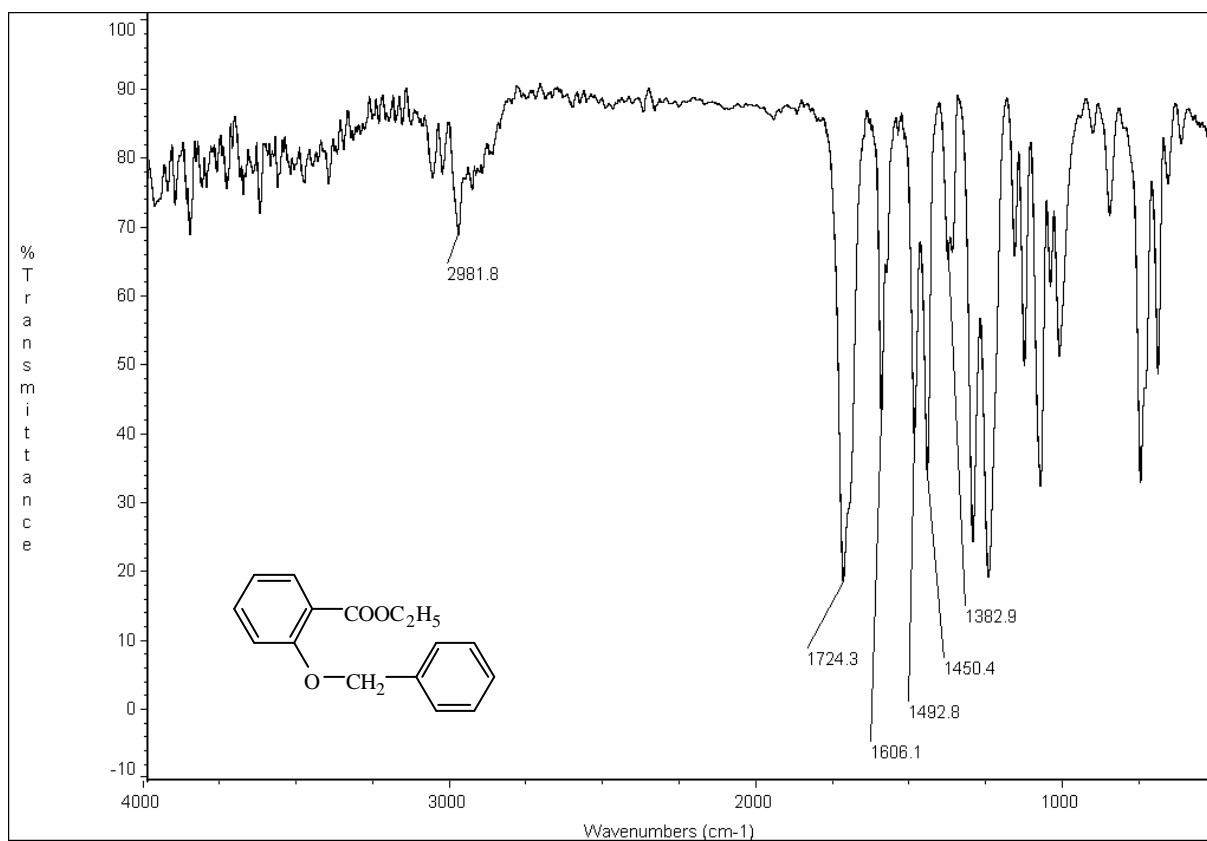


圖 38-2 IR (KBr) spectrum of compound 38

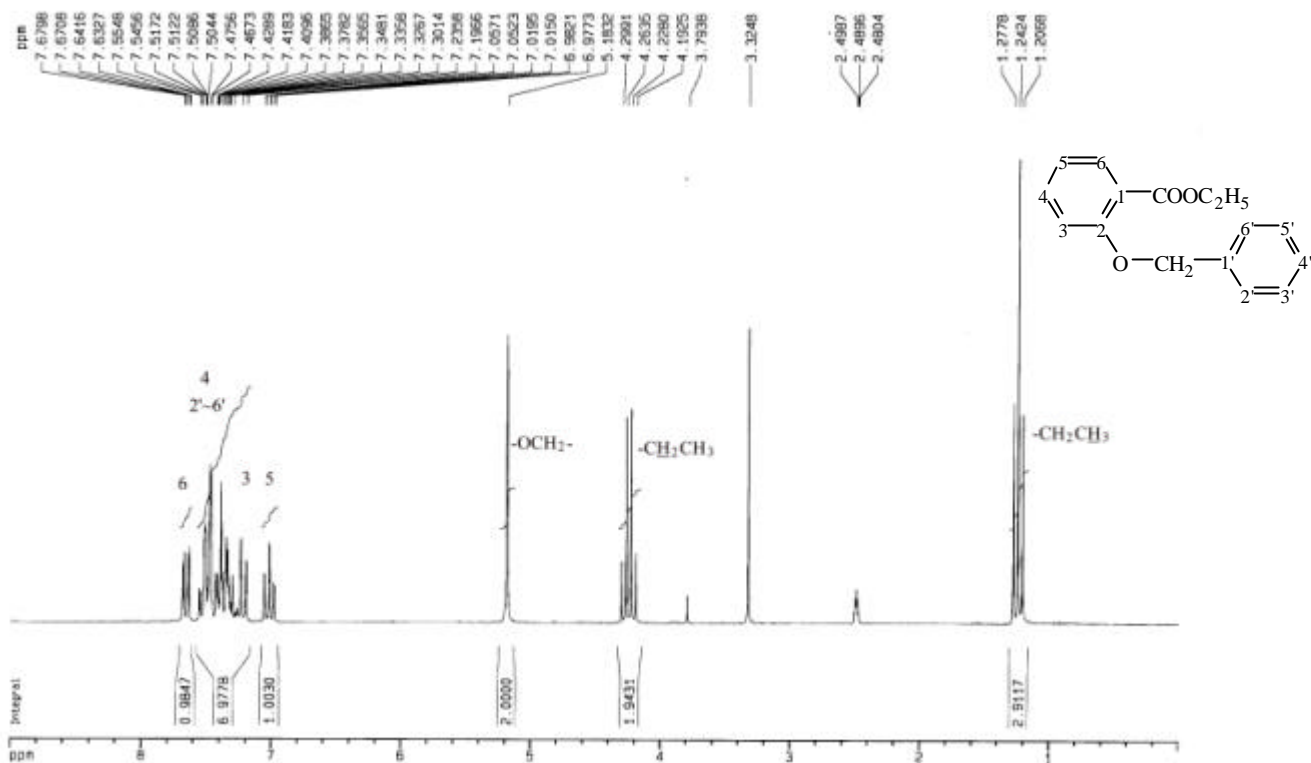


圖 38-3 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound **38**

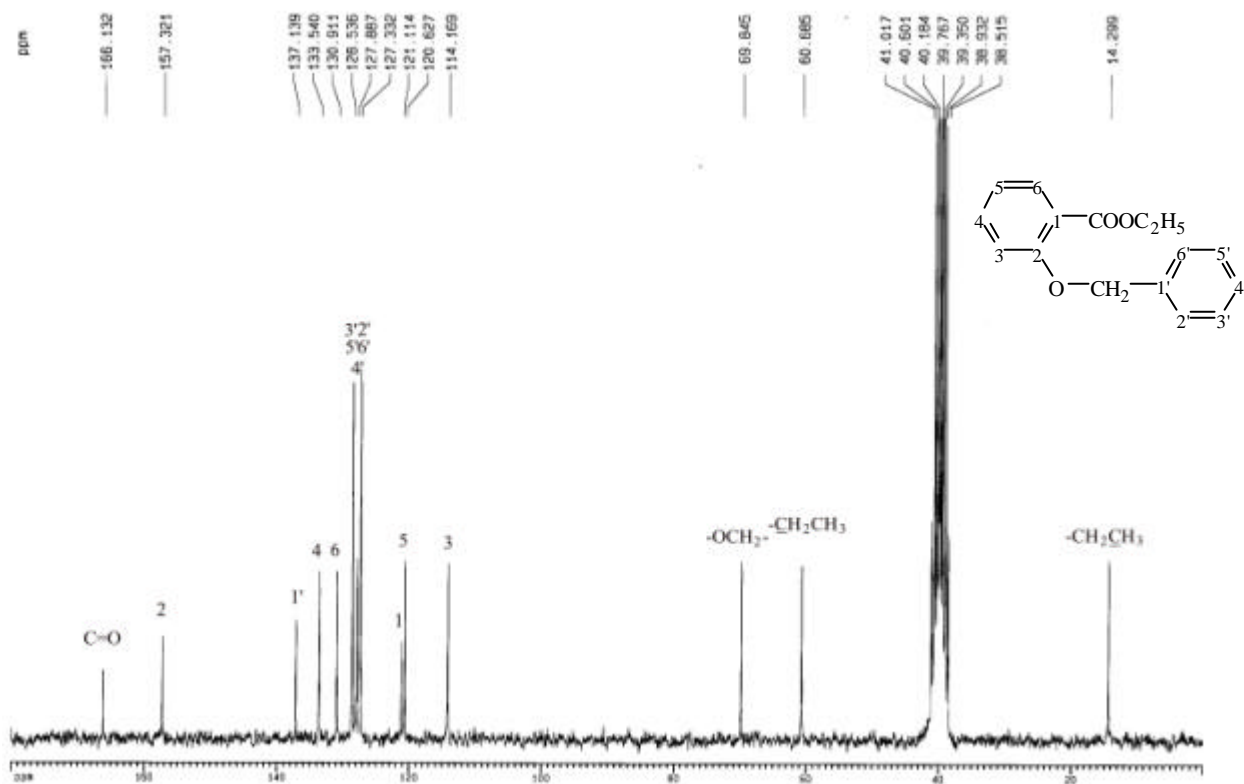


圖 38-4 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound **38**

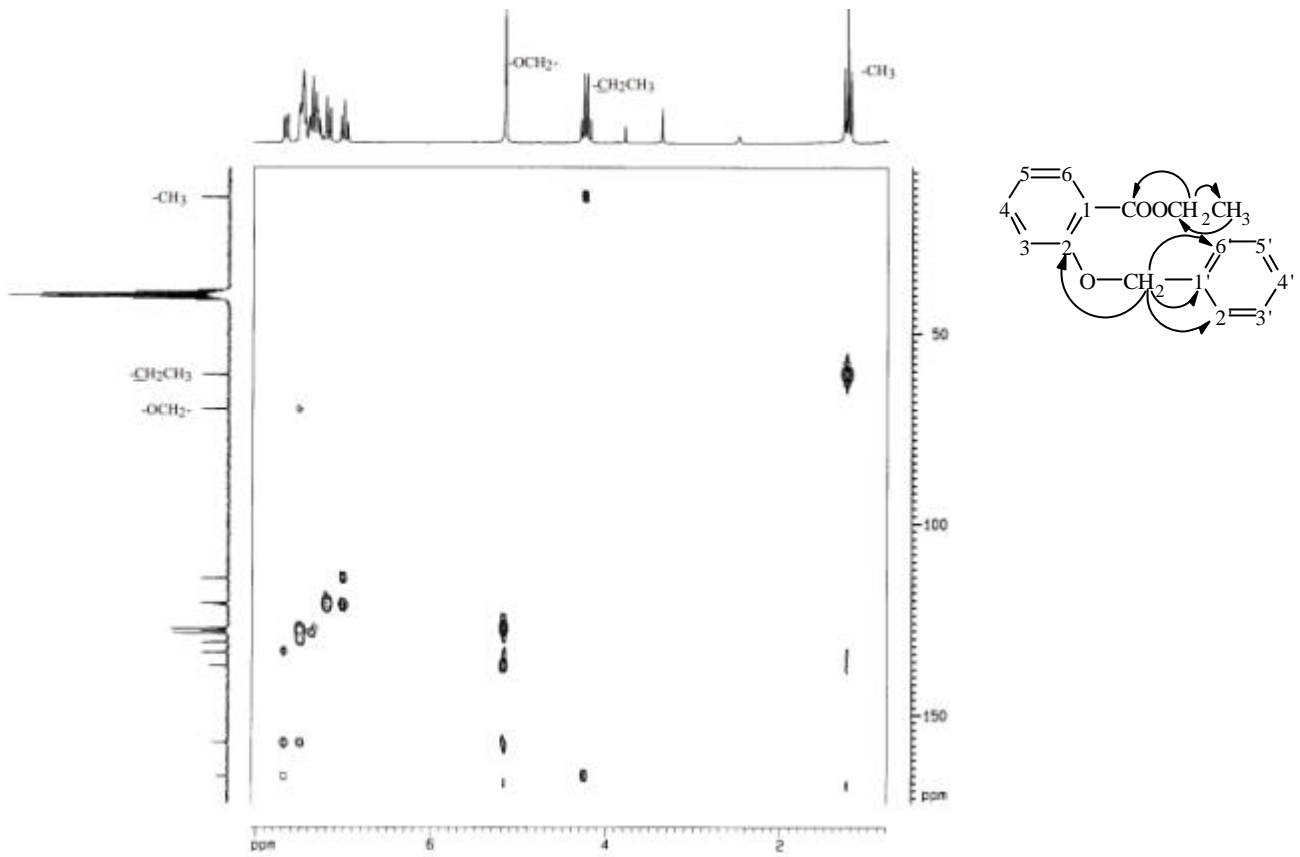


圖 38-5a HMBC (DMSO- $d_6$ ) spectrum of compound **38**

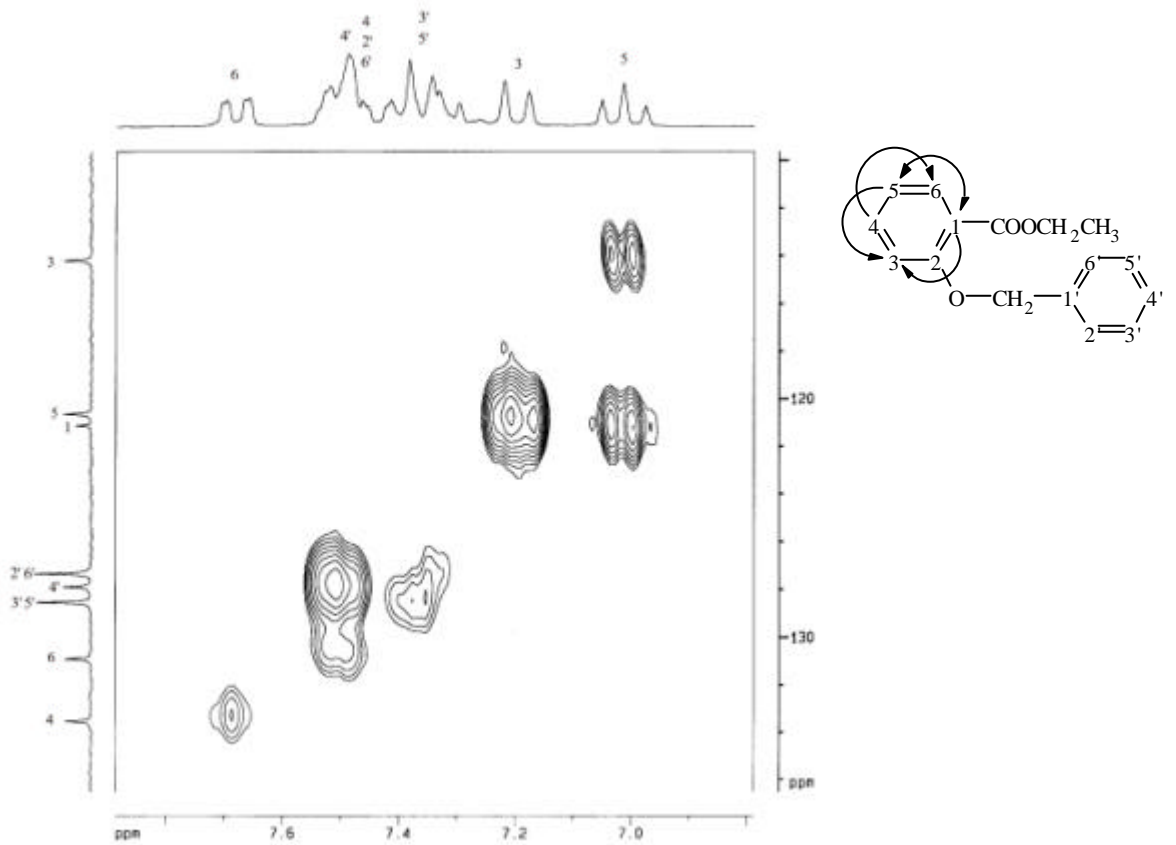


圖 38-5b HMBC (DMSO- $d_6$ ) spectrum of compound **38**



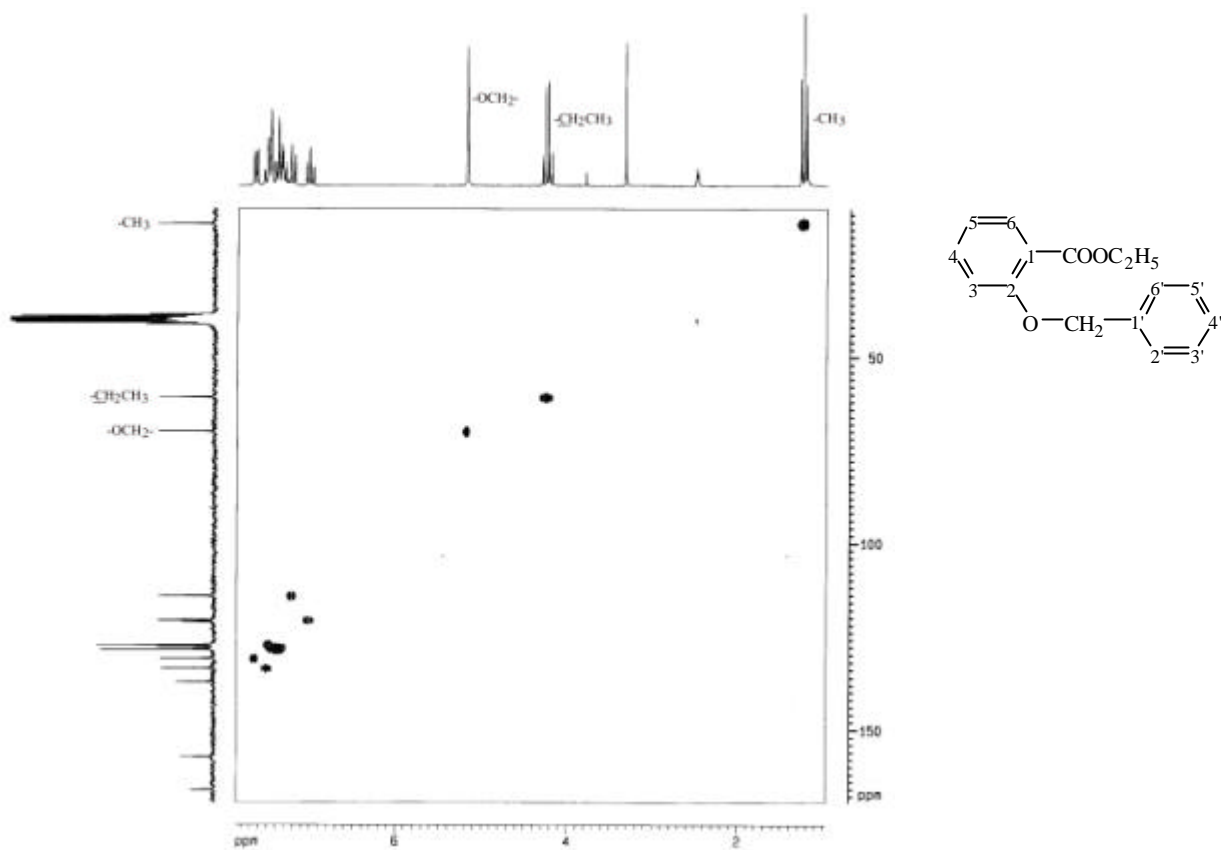


圖 38-6a HMQC (DMSO- $d_6$ ) spectrum of compound **38**

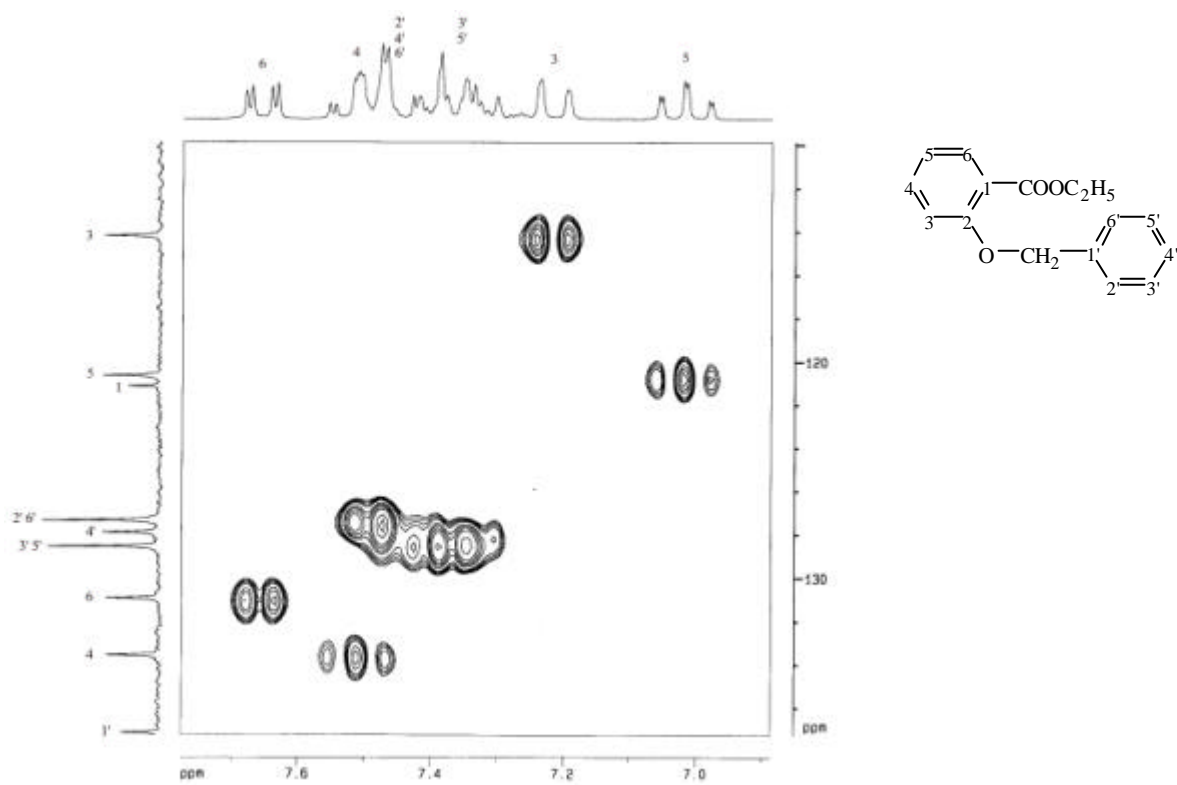


圖 38-6b HMQC (DMSO- $d_6$ ) spectrum of compound **38**

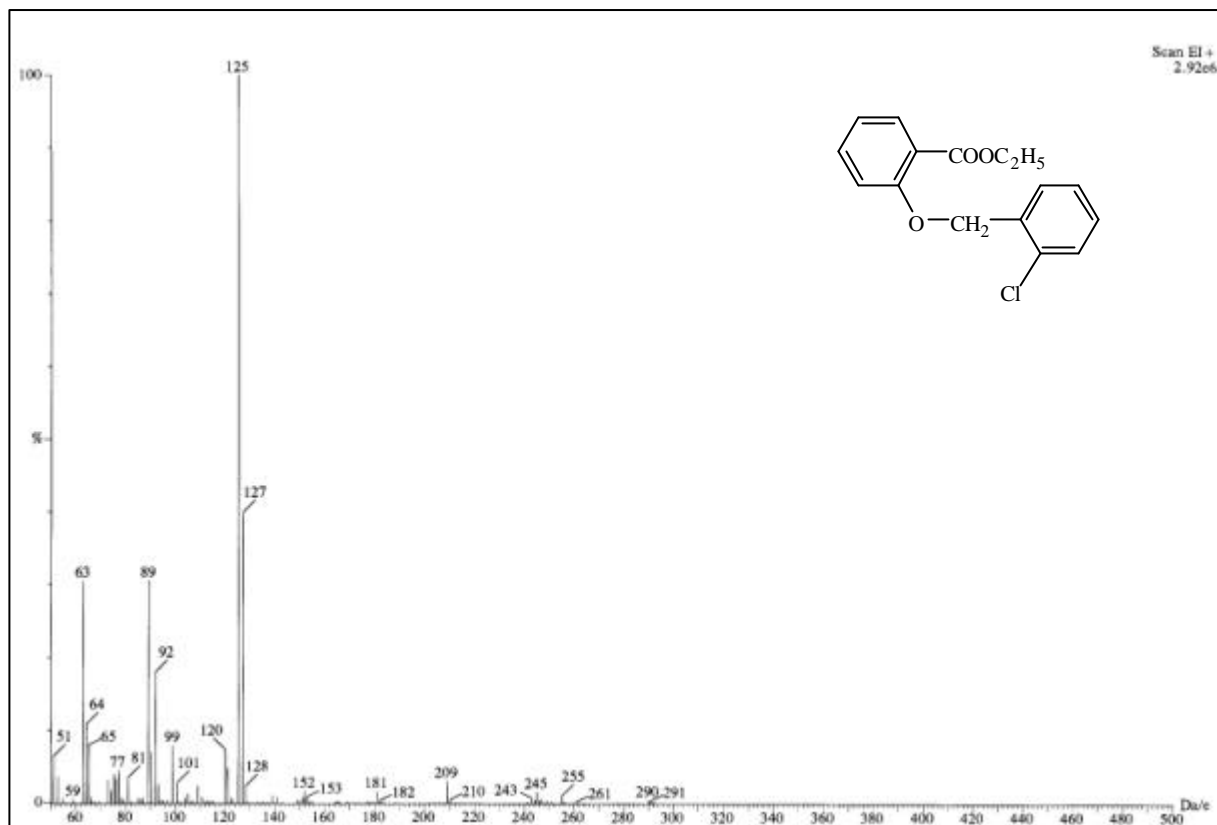


圖 39-1 MS spectrum of compound 39

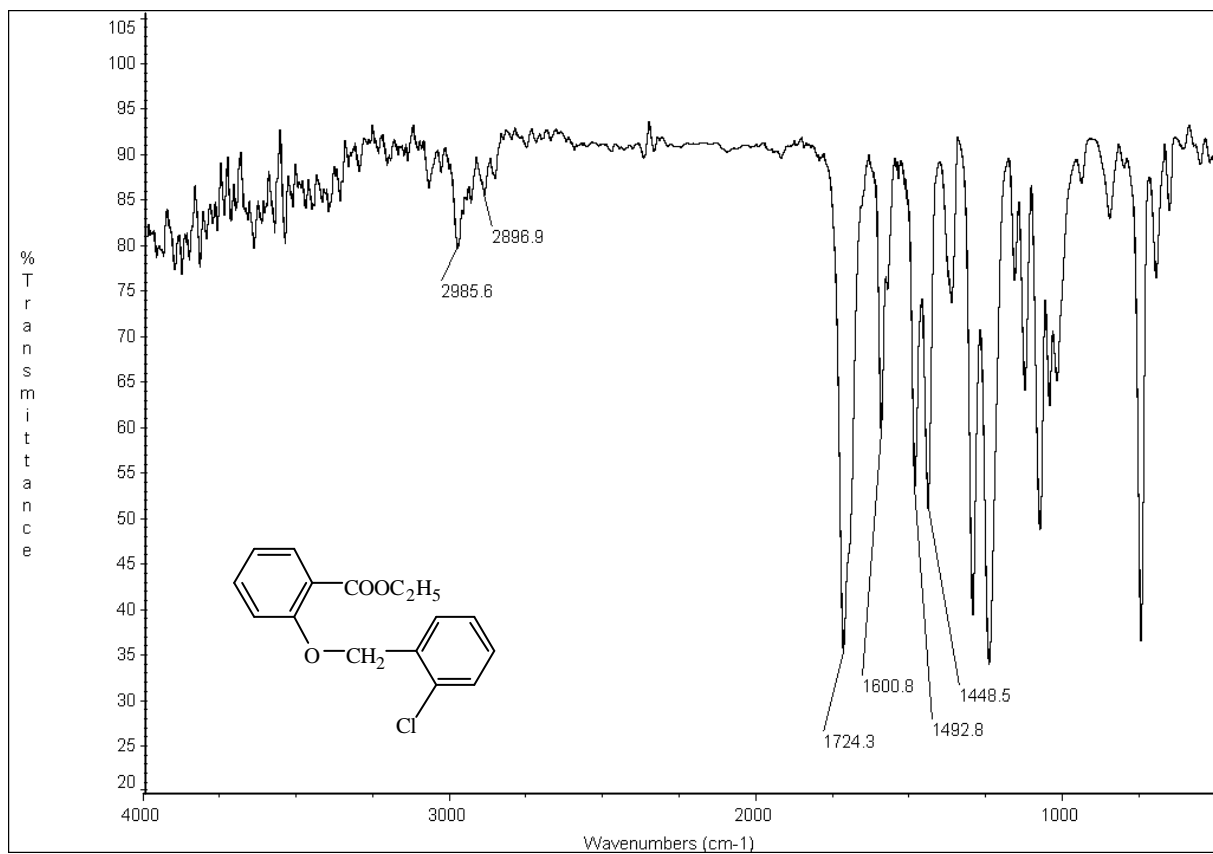


圖 39-2 IR (KBr) spectrum of compound 39

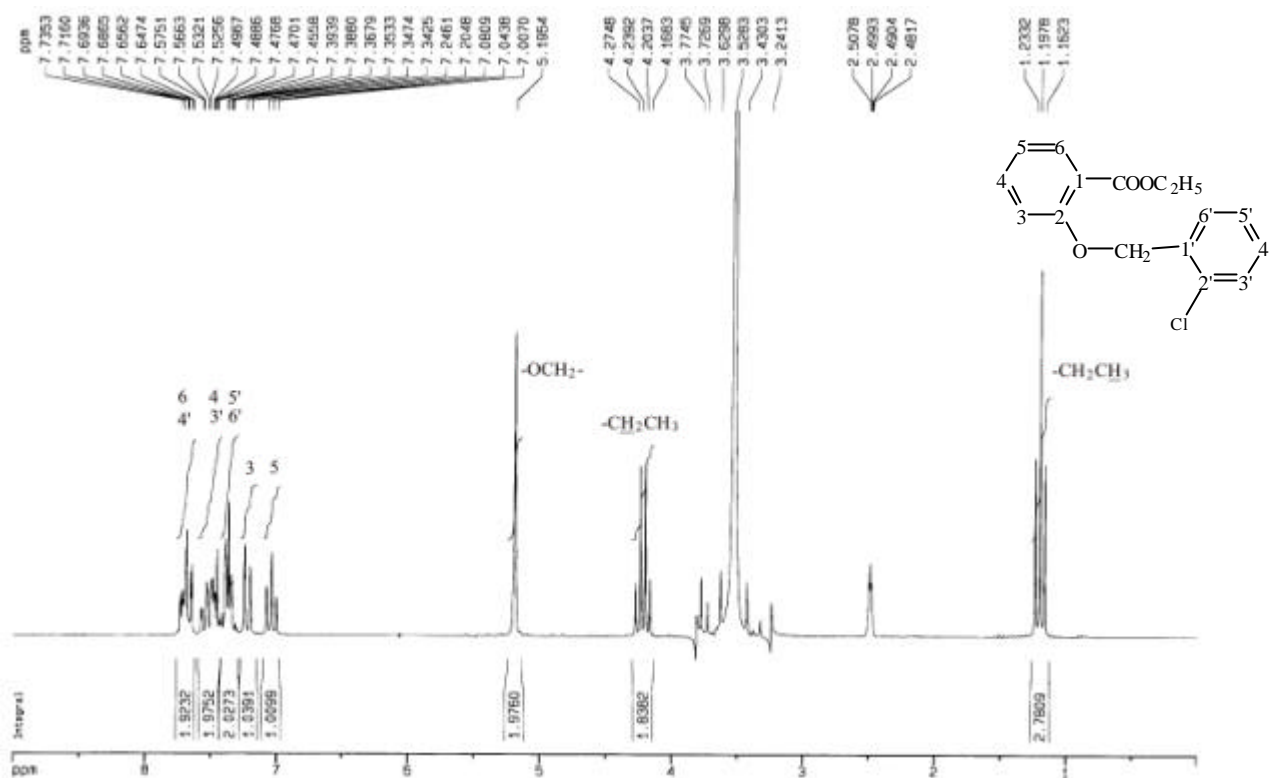


圖 39-3 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound **39**

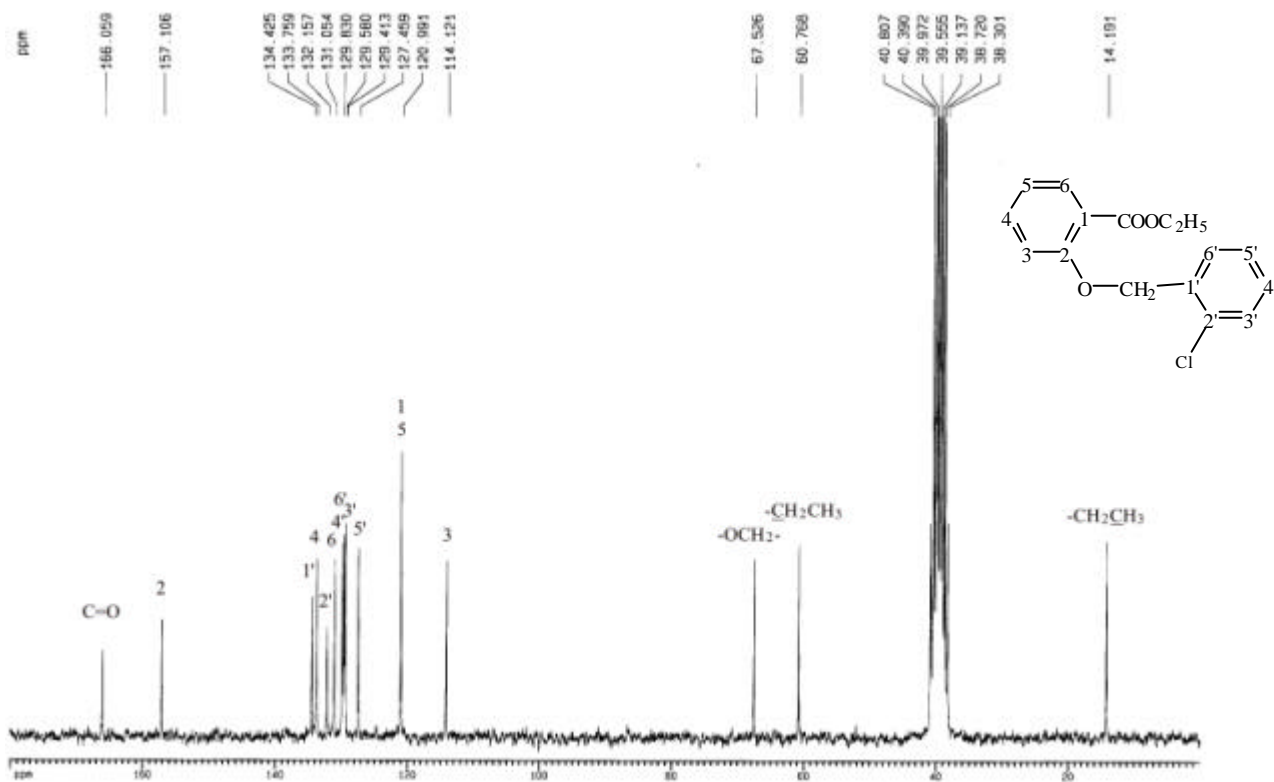


圖 39-4 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound **39**

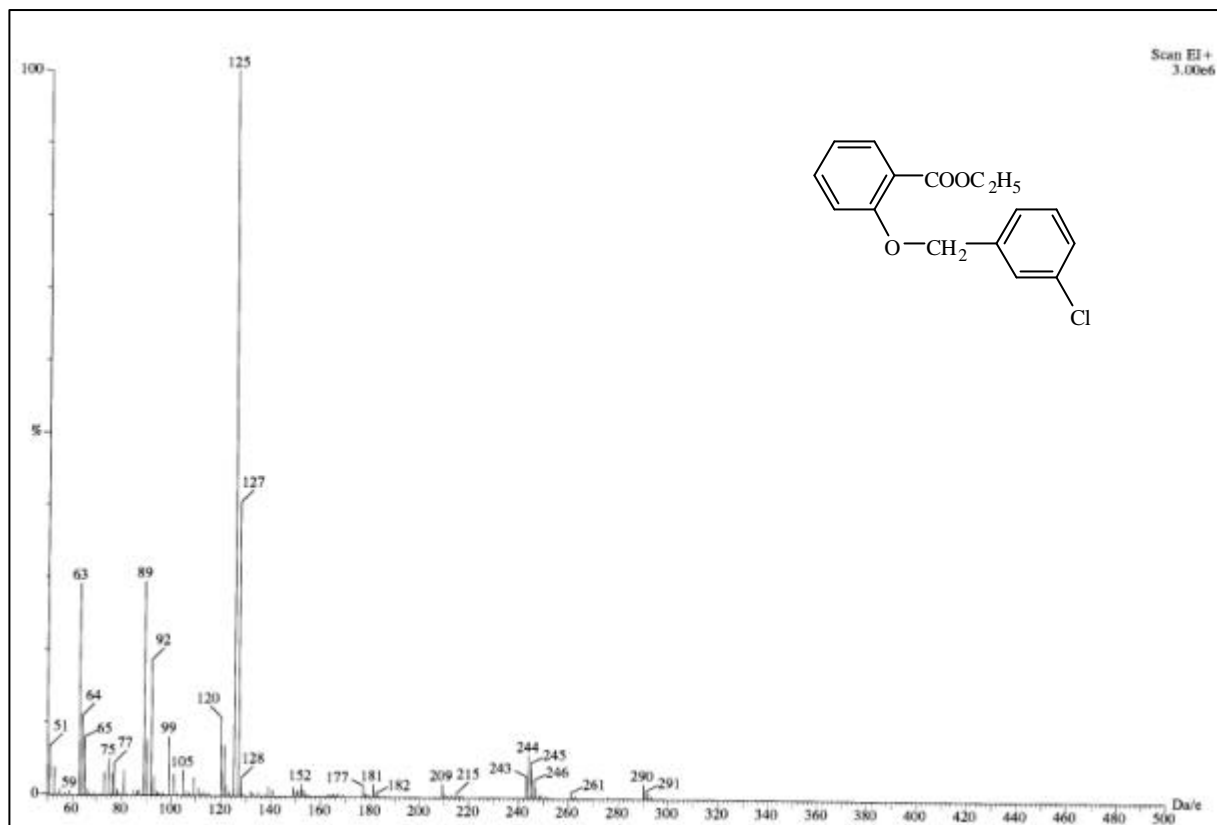


圖 40-1 MS spectrum of compound 40

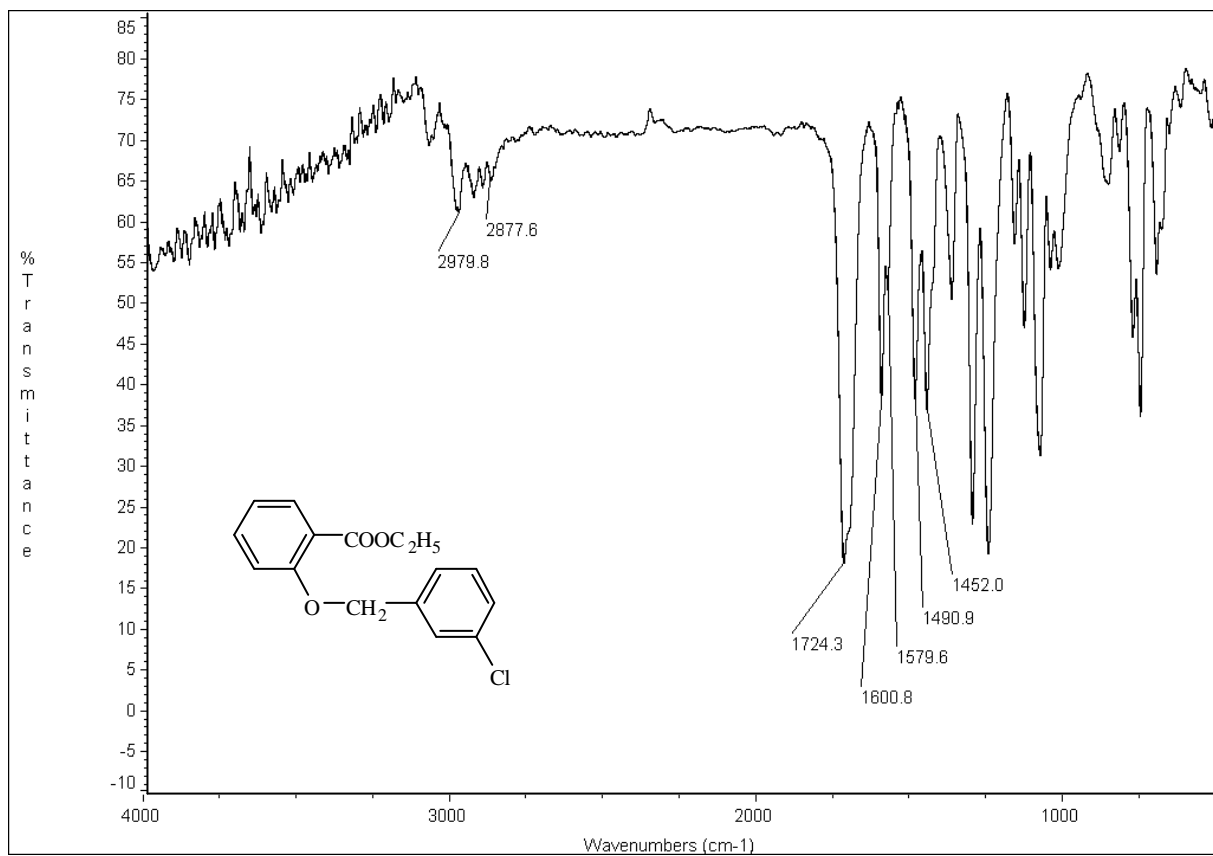


圖 40-2 IR (KBr) spectrum of compound 40

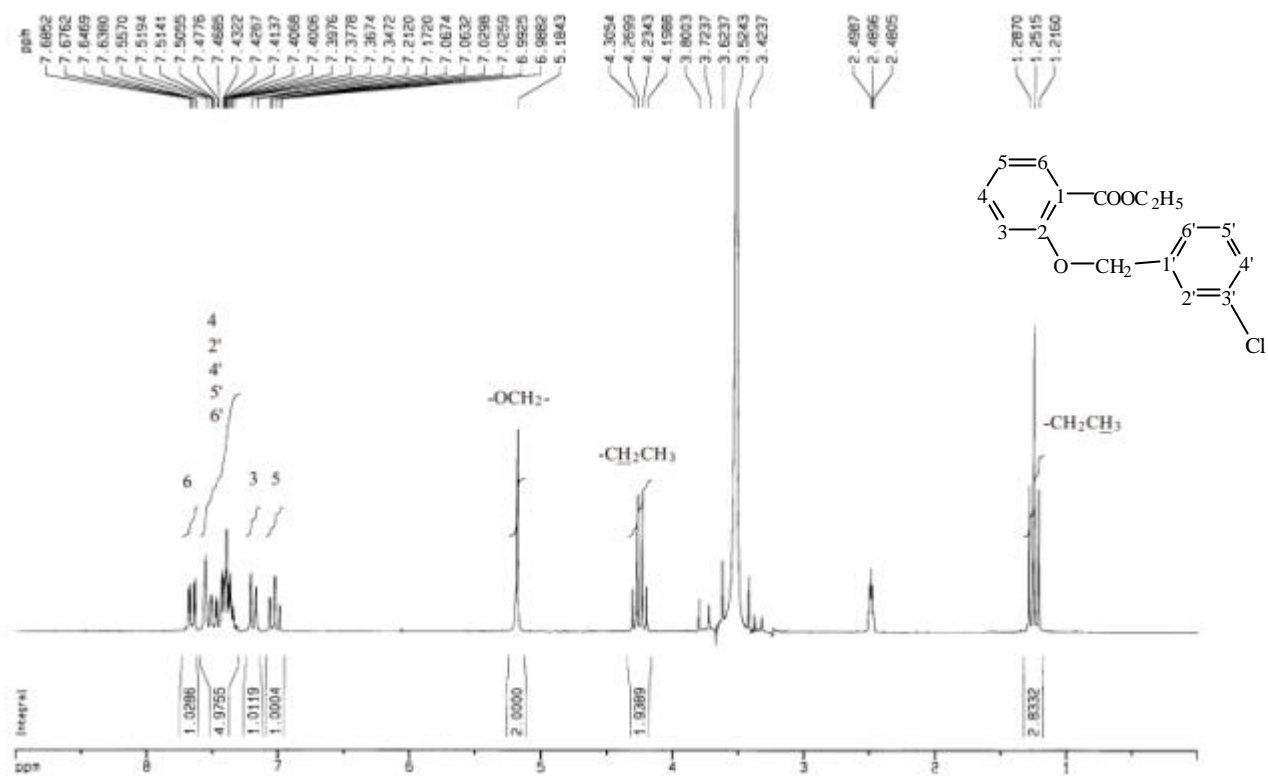


圖 40-3 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound 40

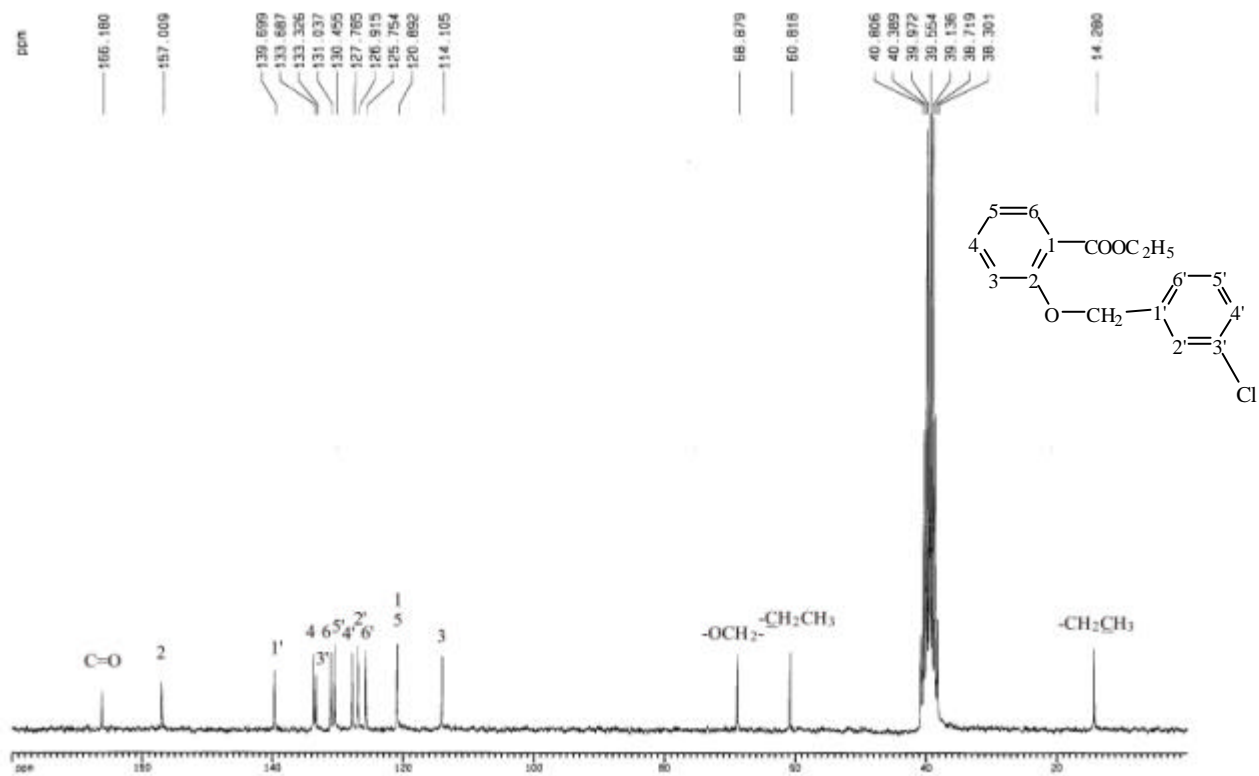


圖 40-4 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound 40

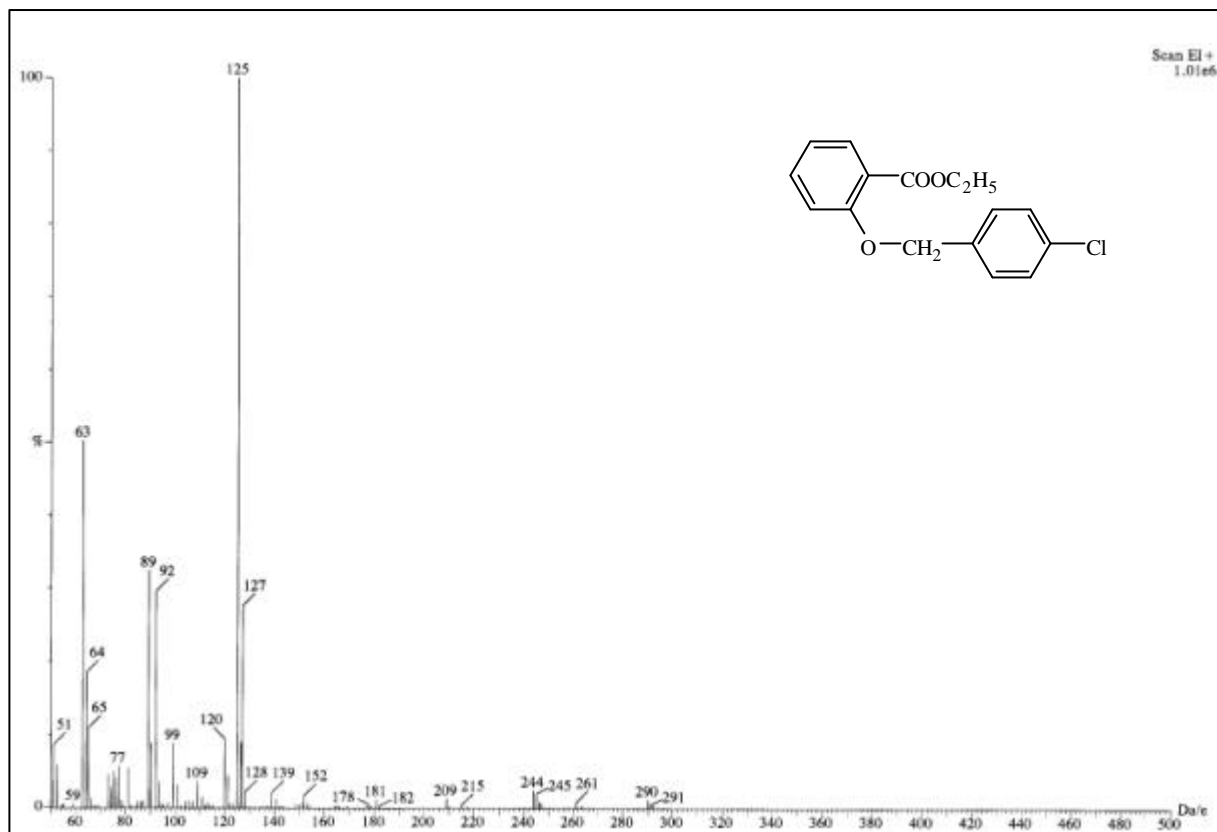


圖 41-1 MS spectrum of compound 41

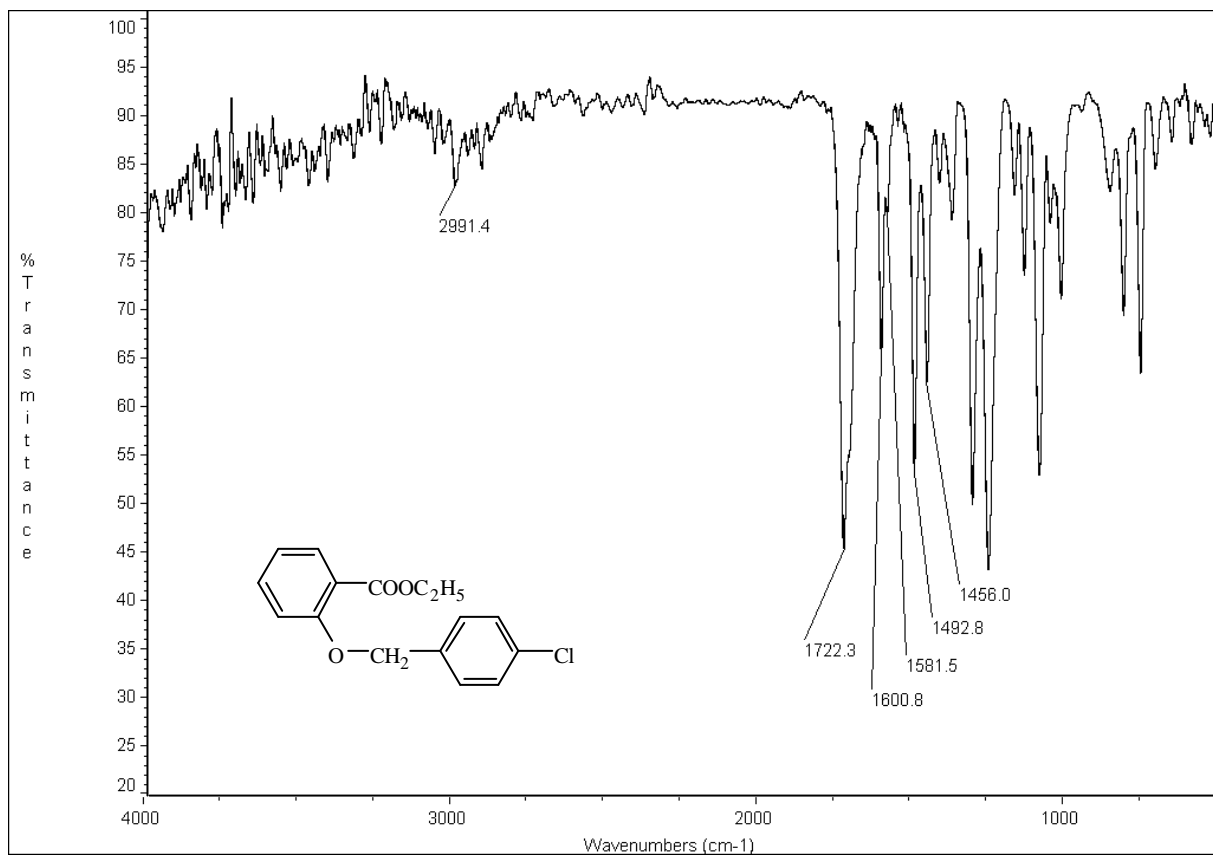


圖 41-2 IR (KBr) spectrum of compound 41

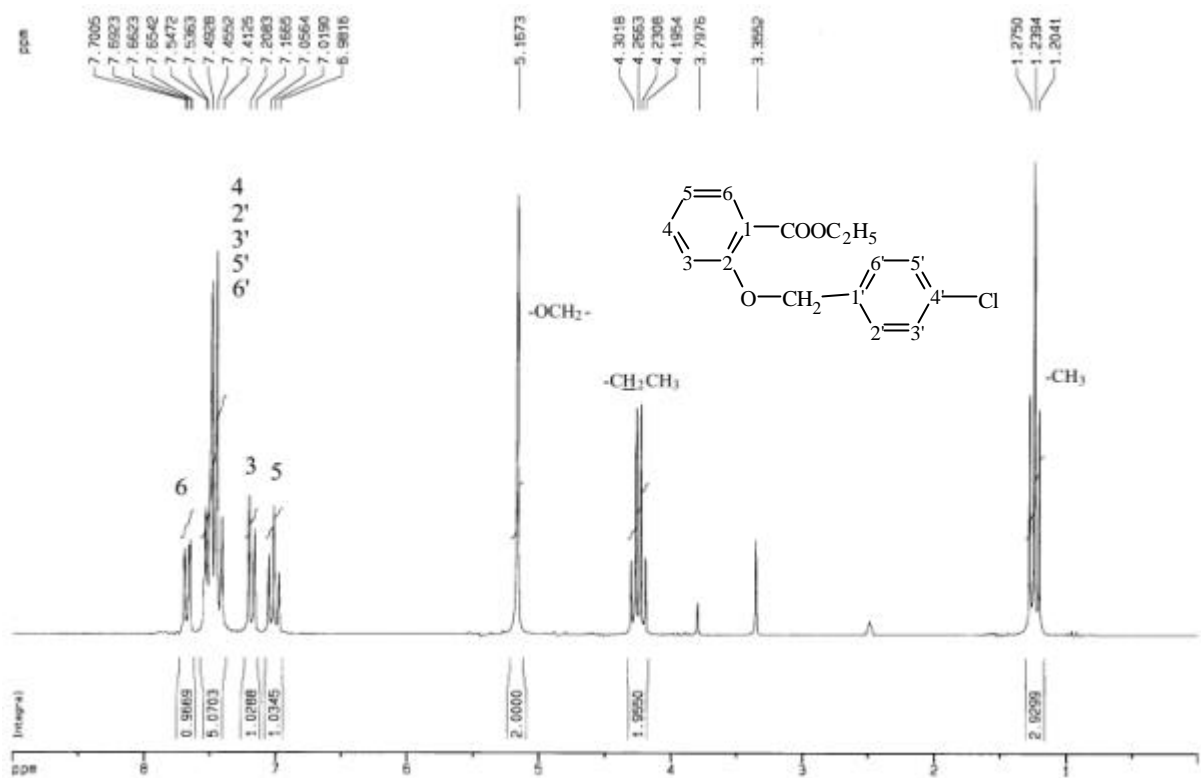


圖 41-3  $^1\text{H-NMR}$  ( $\text{DMSO-}d_6$ , 200 MHz) spectrum of compound **41**

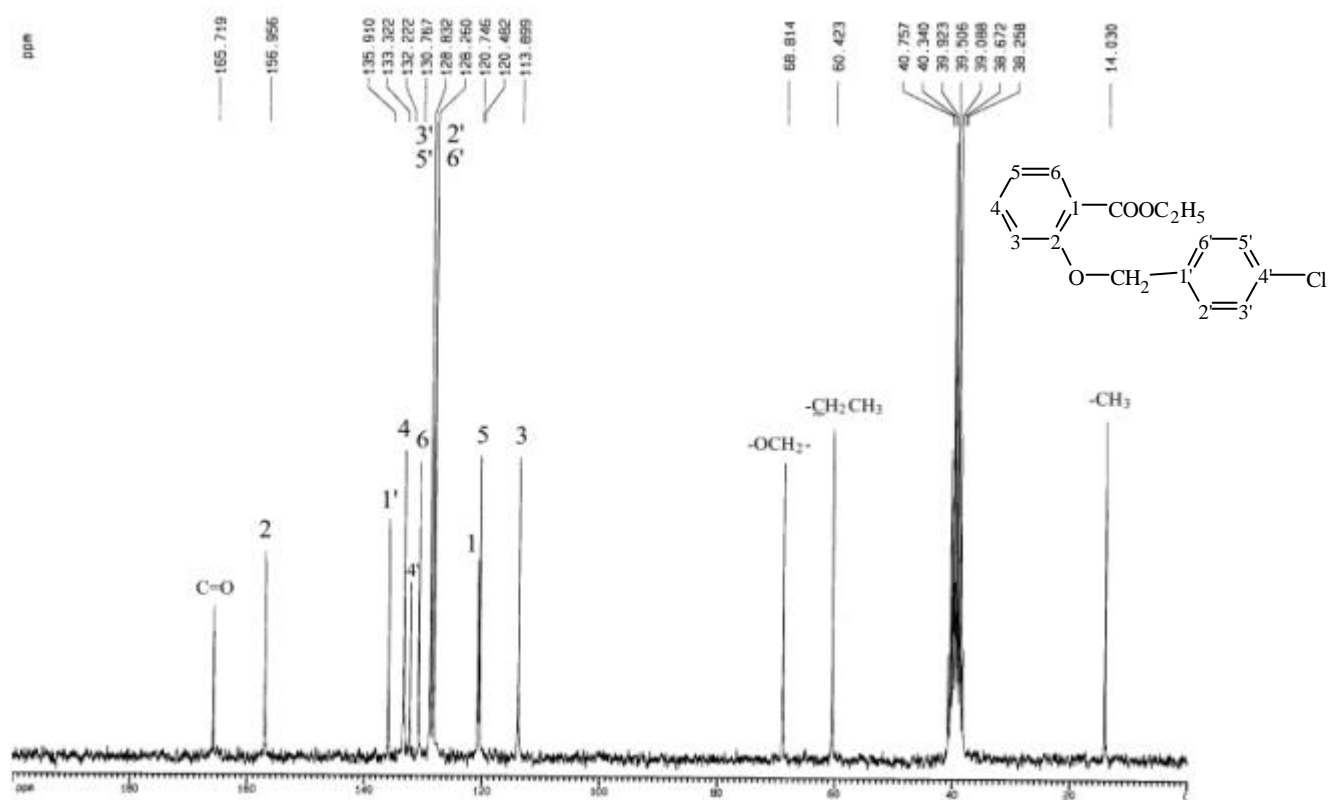


圖 41-4  $^{13}\text{C-NMR}$  ( $\text{DMSO-}d_6$ , 50 MHz) spectrum of compound **41**

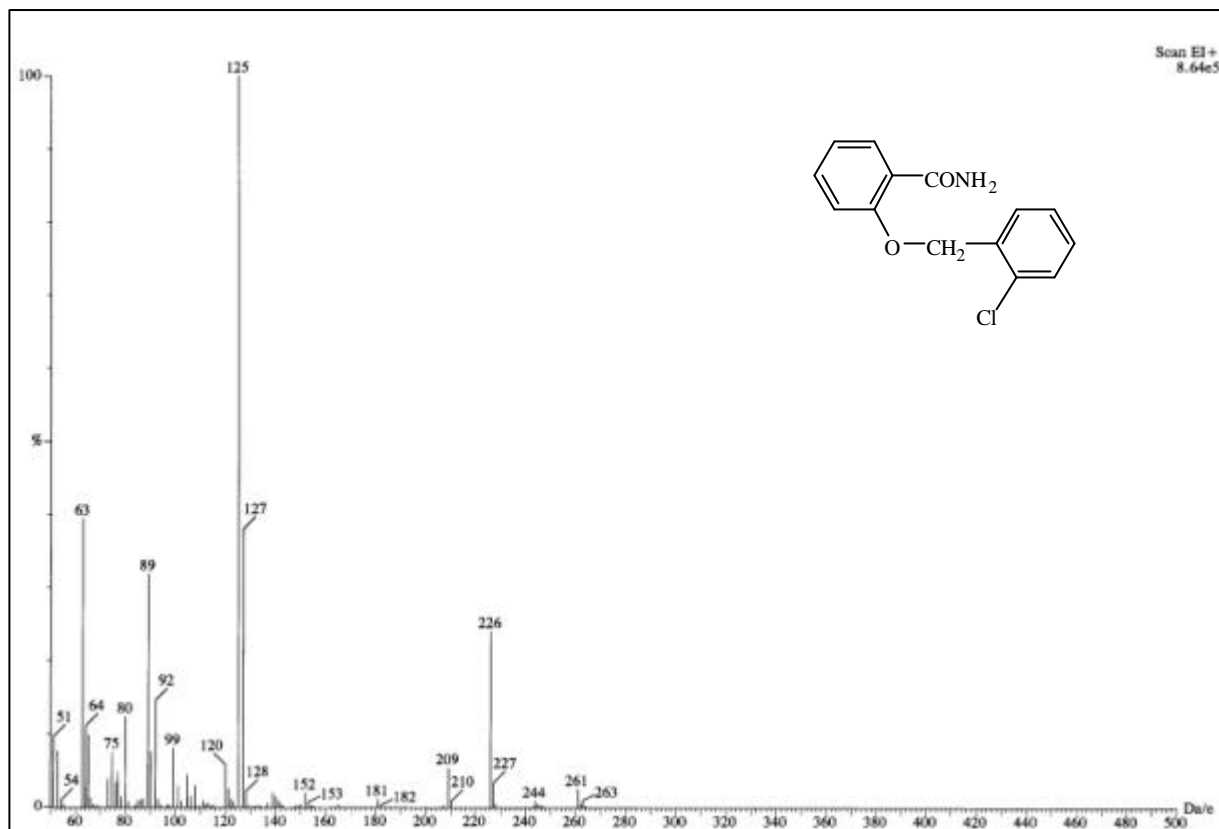


圖 42-1 MS spectrum of compound 42

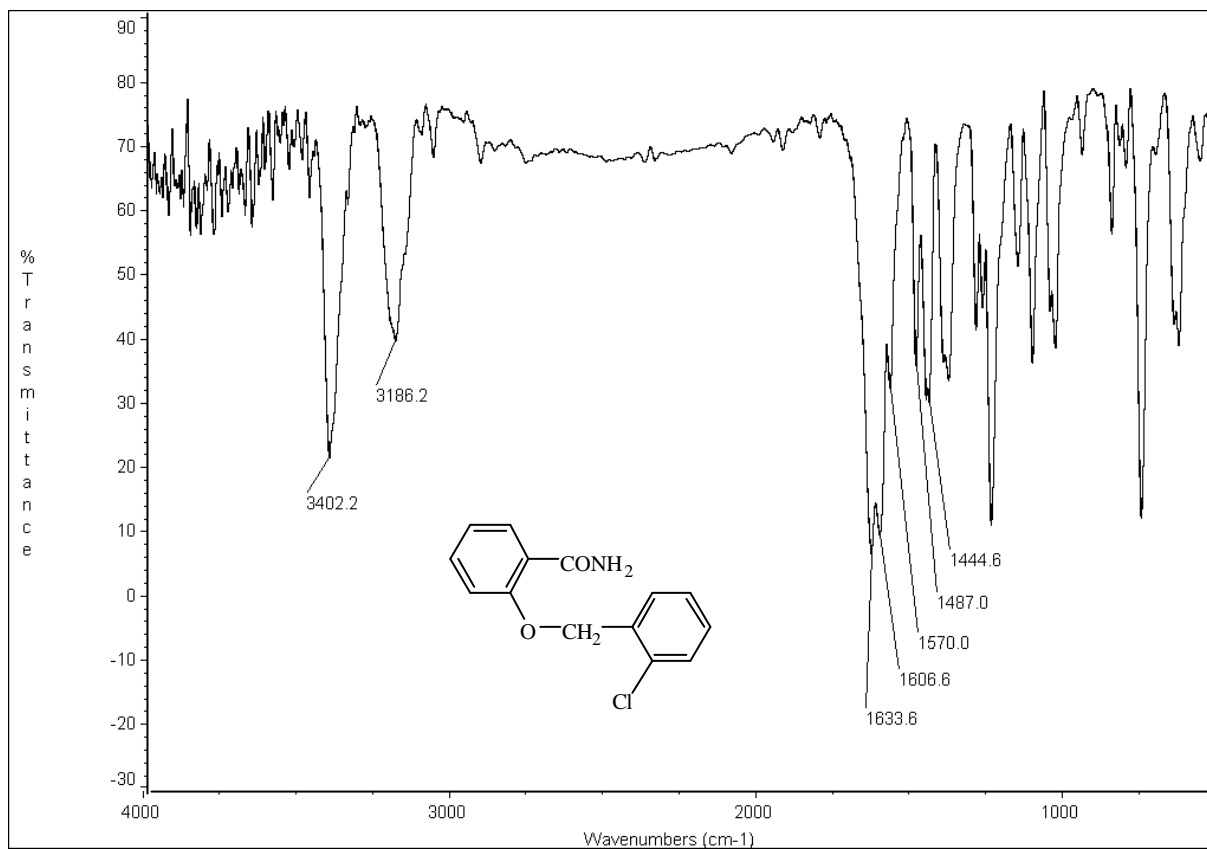


圖 42-2 IR (KBr) spectrum of compound 42



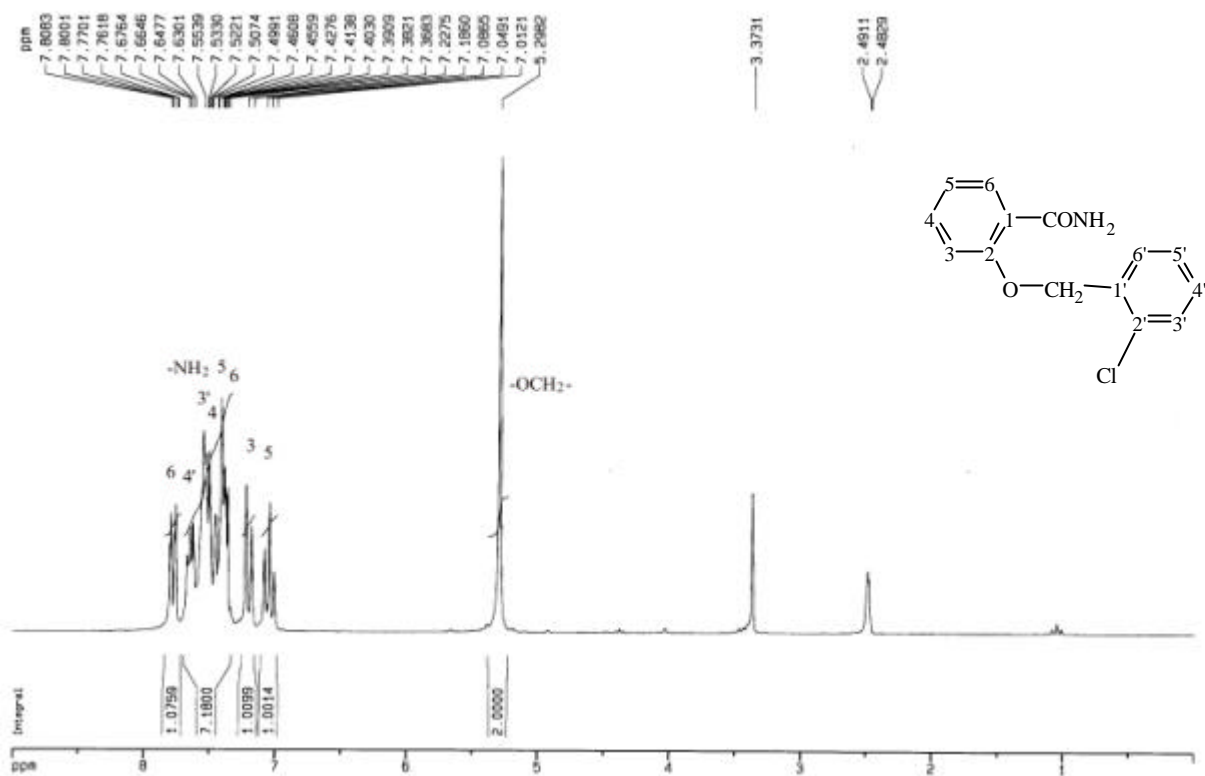


圖 42-3  $^1\text{H-NMR}$  (DMSO- $d_6$ , 200 MHz) spectrum of compound **42**

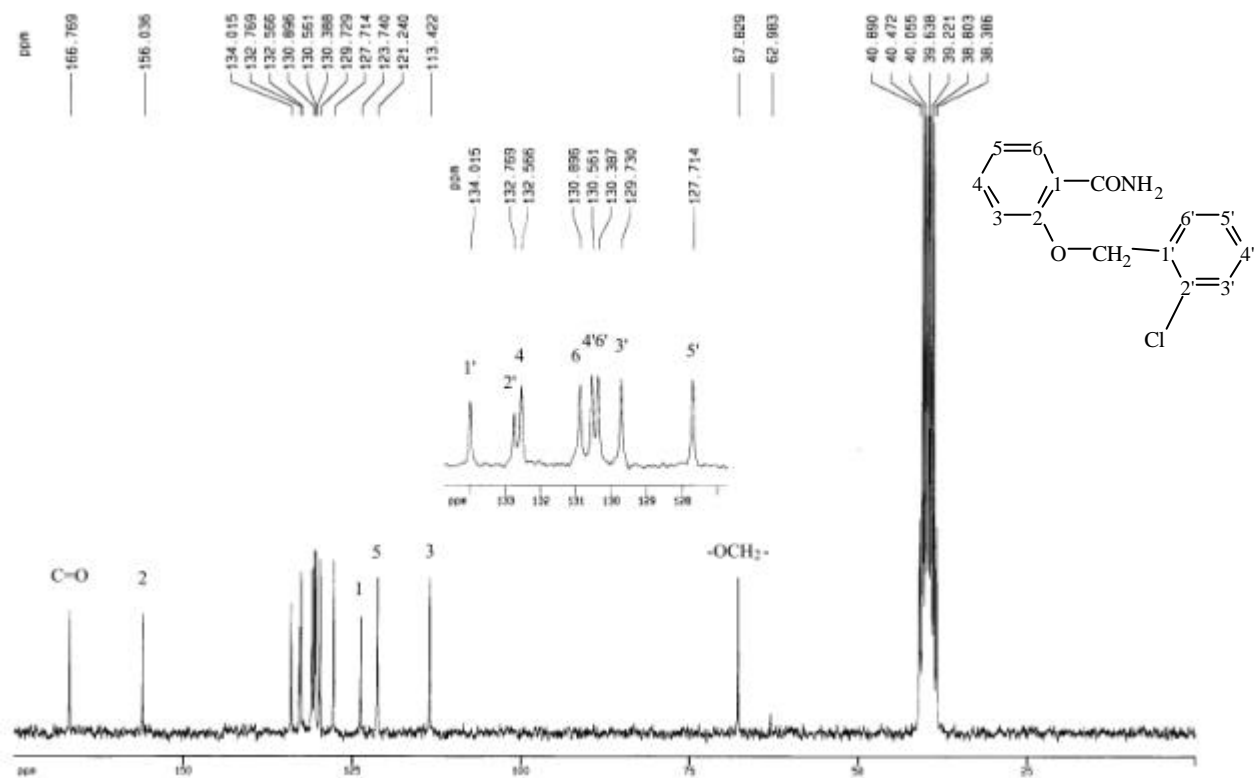


圖 42-4  $^{13}\text{C-NMR}$  (DMSO- $d_6$ , 50 MHz) spectrum of compound **42**

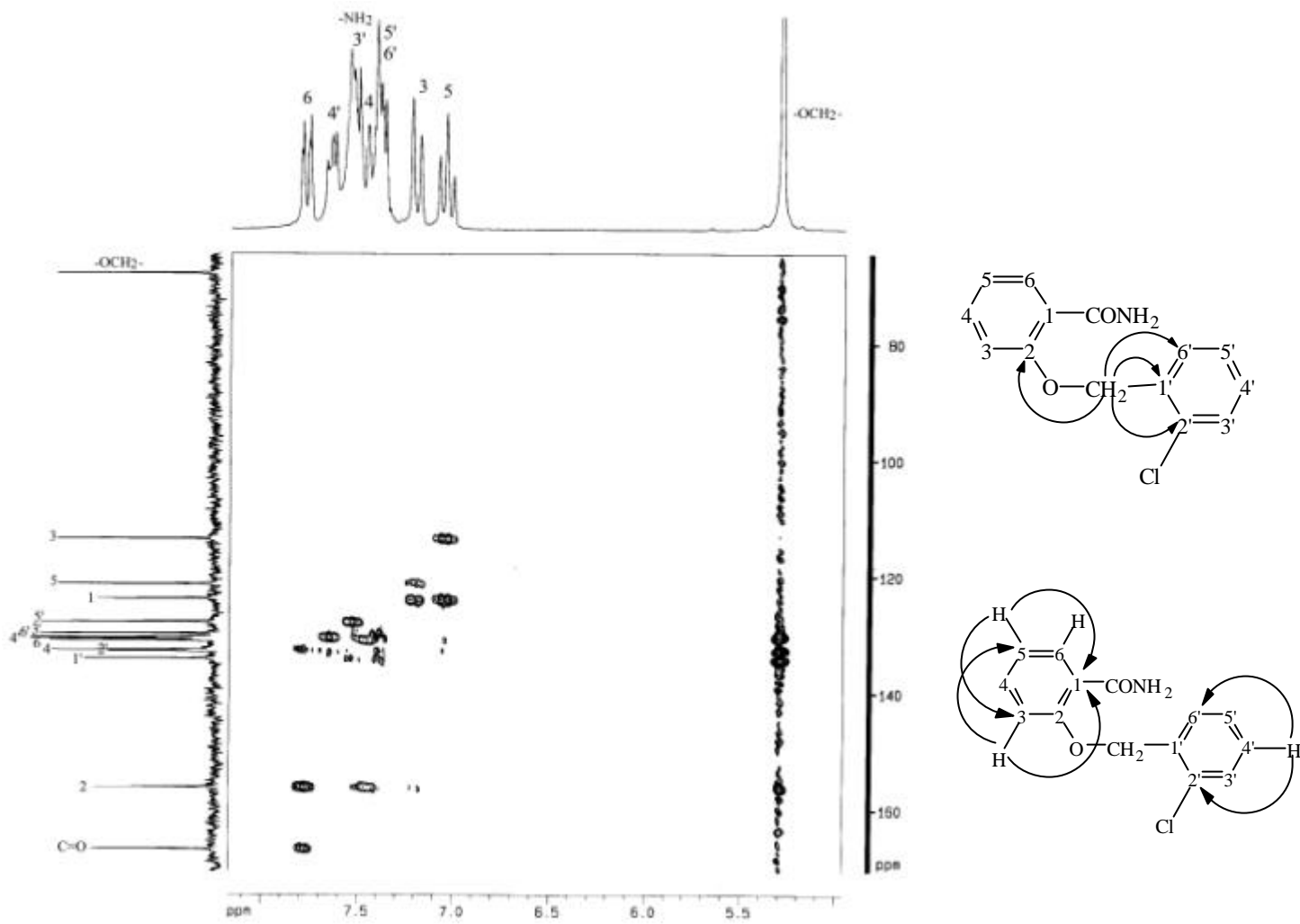


圖 42-5a HMBC (DMSO- $d_6$ ) spectrum of compound **42**

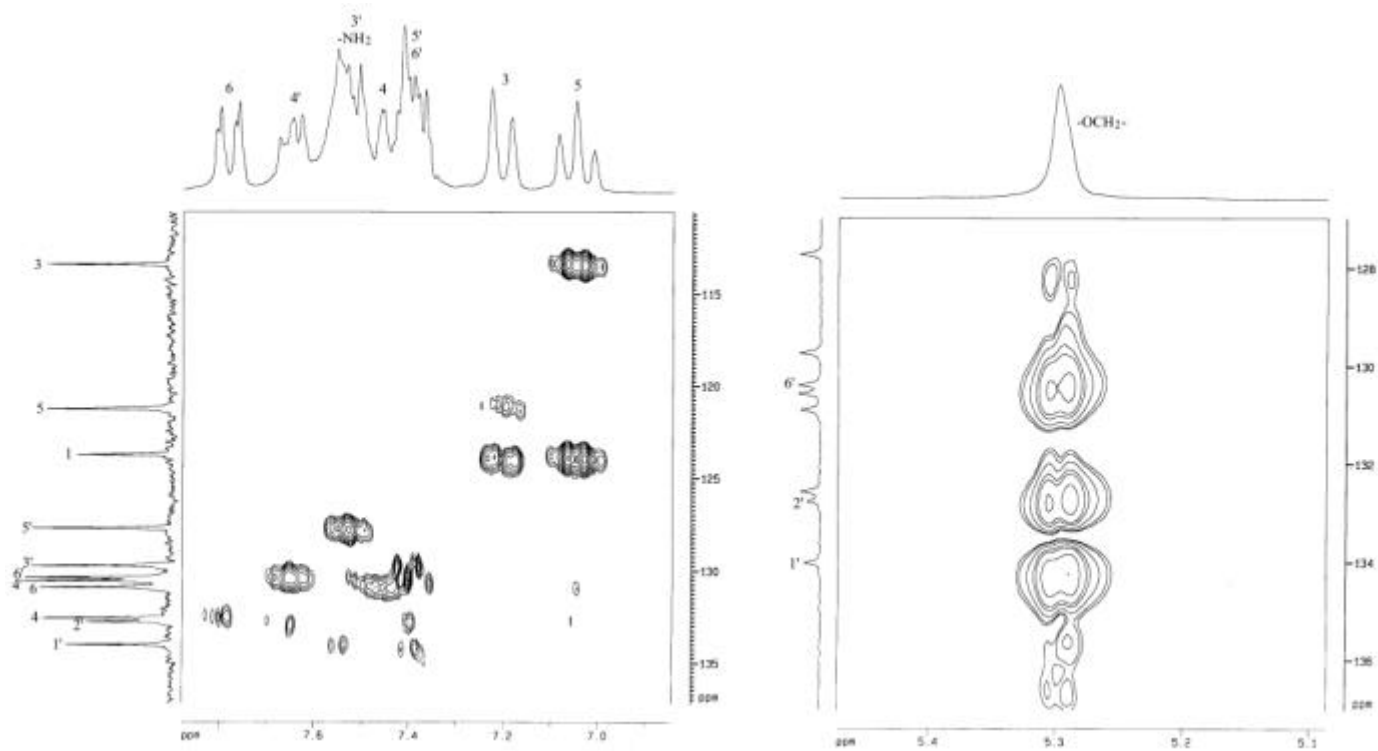


圖 42-5b HMBC (DMSO- $d_6$ ) spectrum of compound **42**

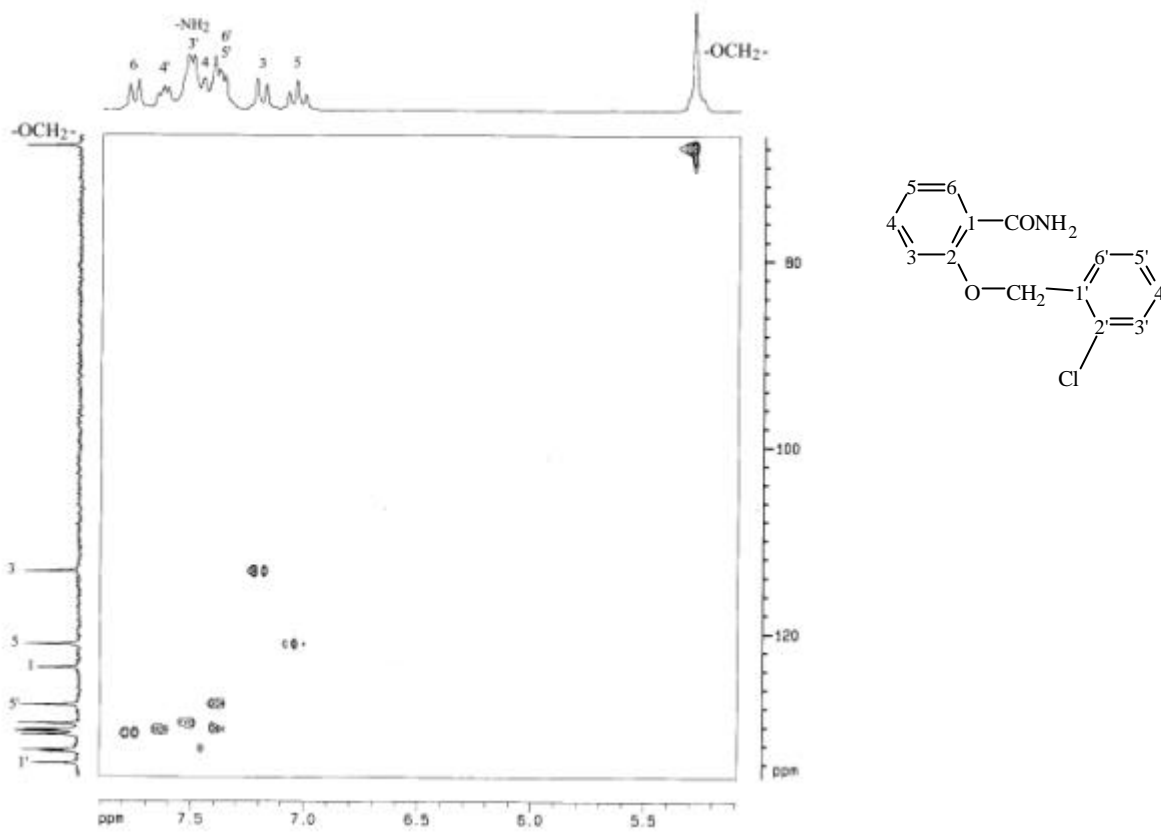


圖 42-6a HMQC (DMSO- $d_6$ ) spectrum of compound **42**

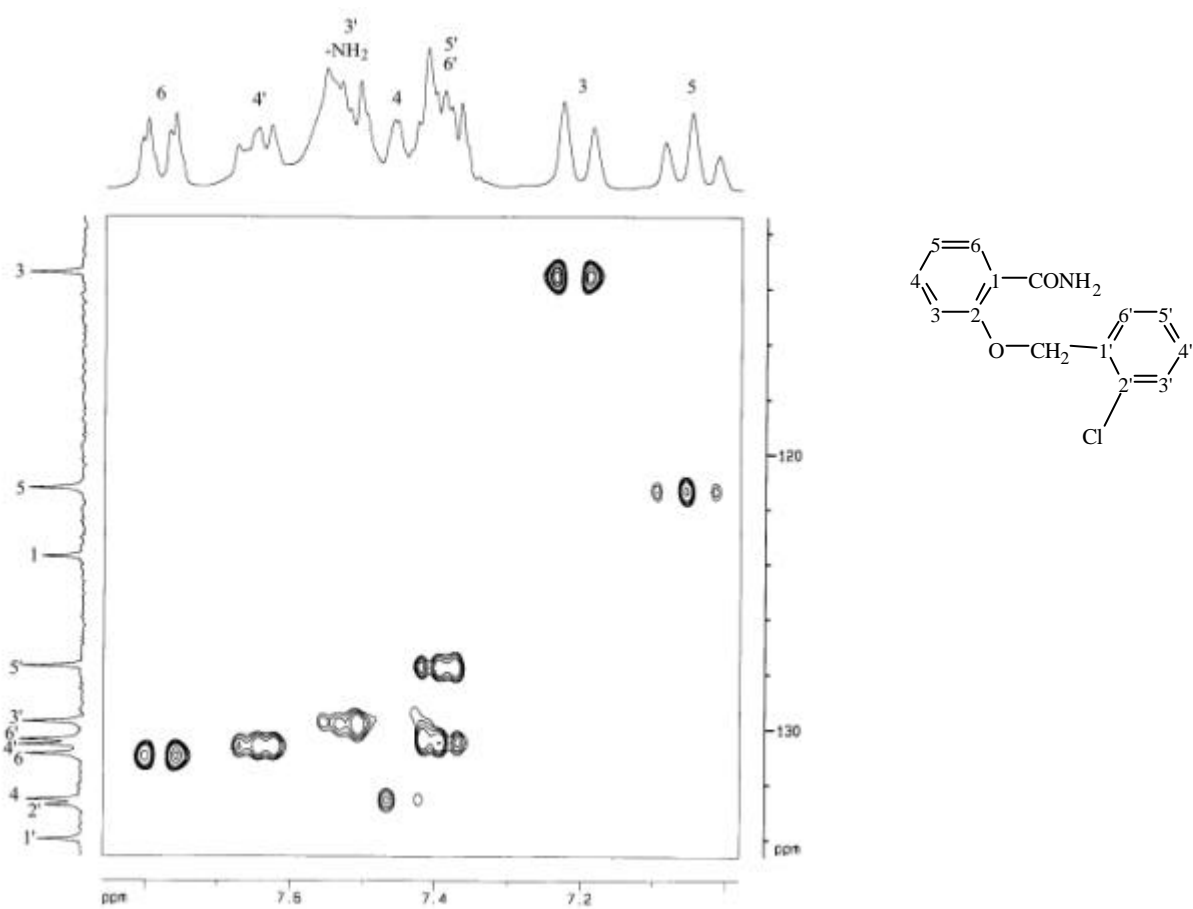


圖 42-6b HMQC (DMSO- $d_6$ ) spectrum of compound **42**

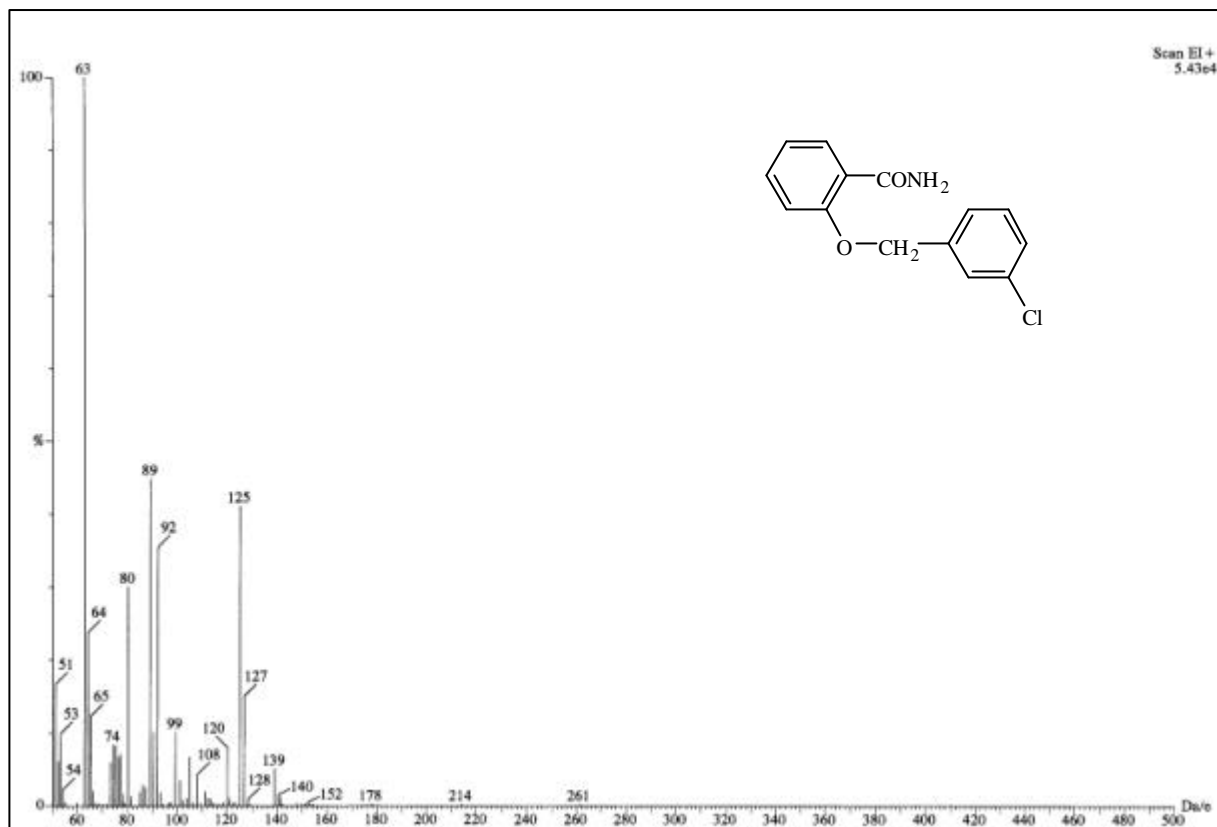


圖 43-1 MS spectrum of compound 43

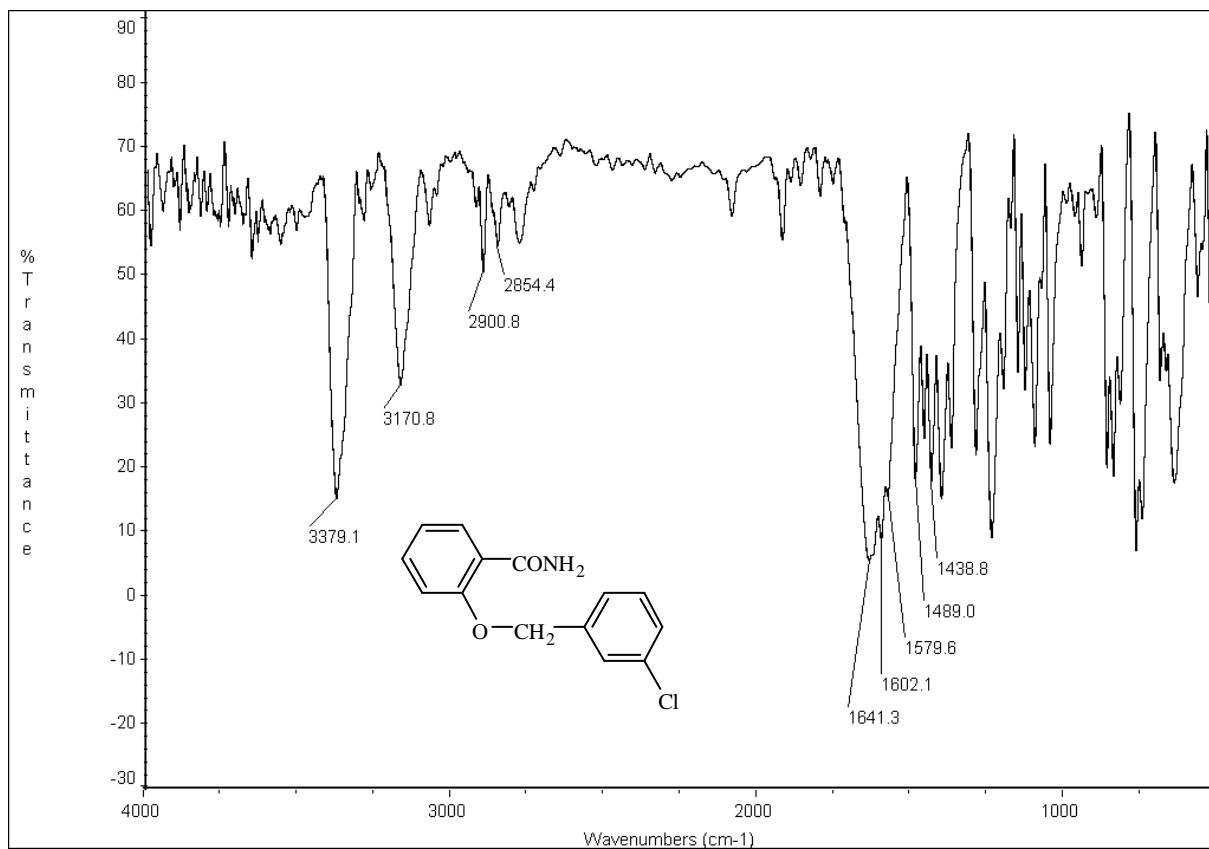


圖 43-2 IR (KBr) spectrum of compound 43

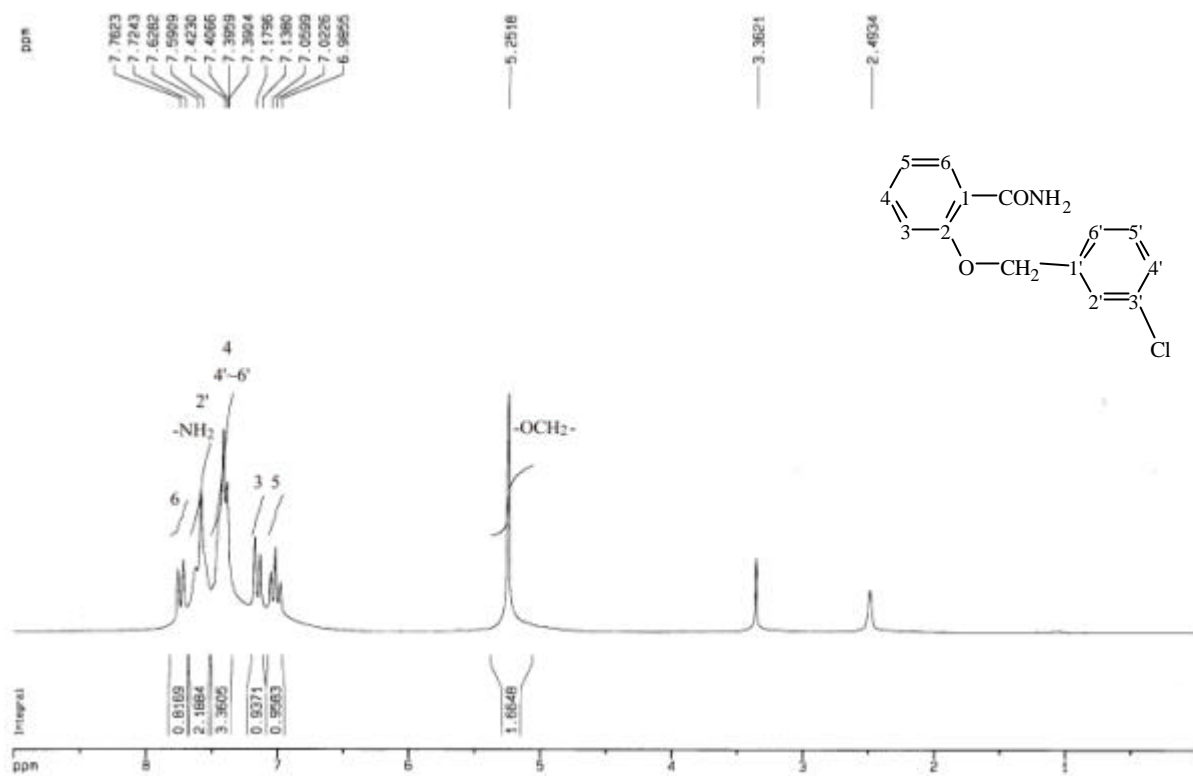


圖 43-3  $^1\text{H-NMR}$  ( $\text{DMSO-}d_6$ , 200 MHz) spectrum of compound **43**

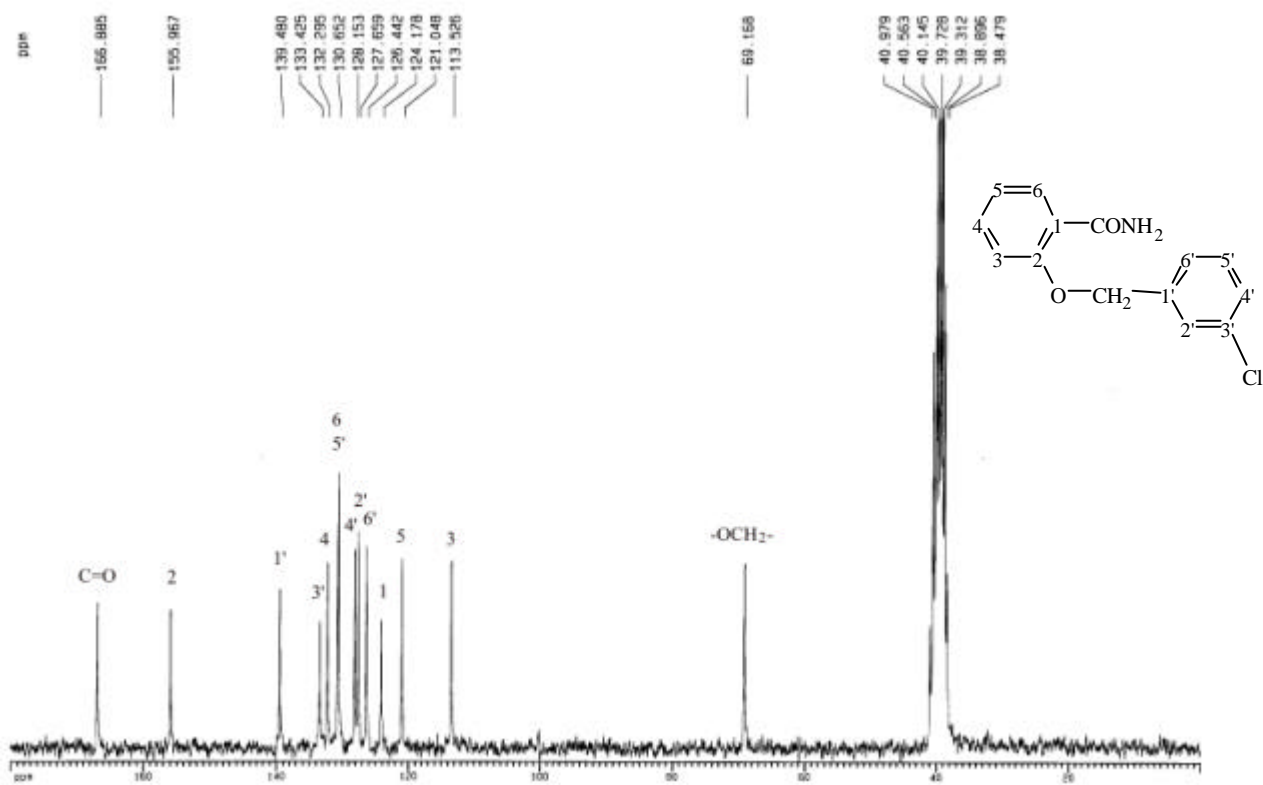


圖 43-4  $^{13}\text{C-NMR}$  ( $\text{DMSO-}d_6$ , 50 MHz) spectrum of compound **43**

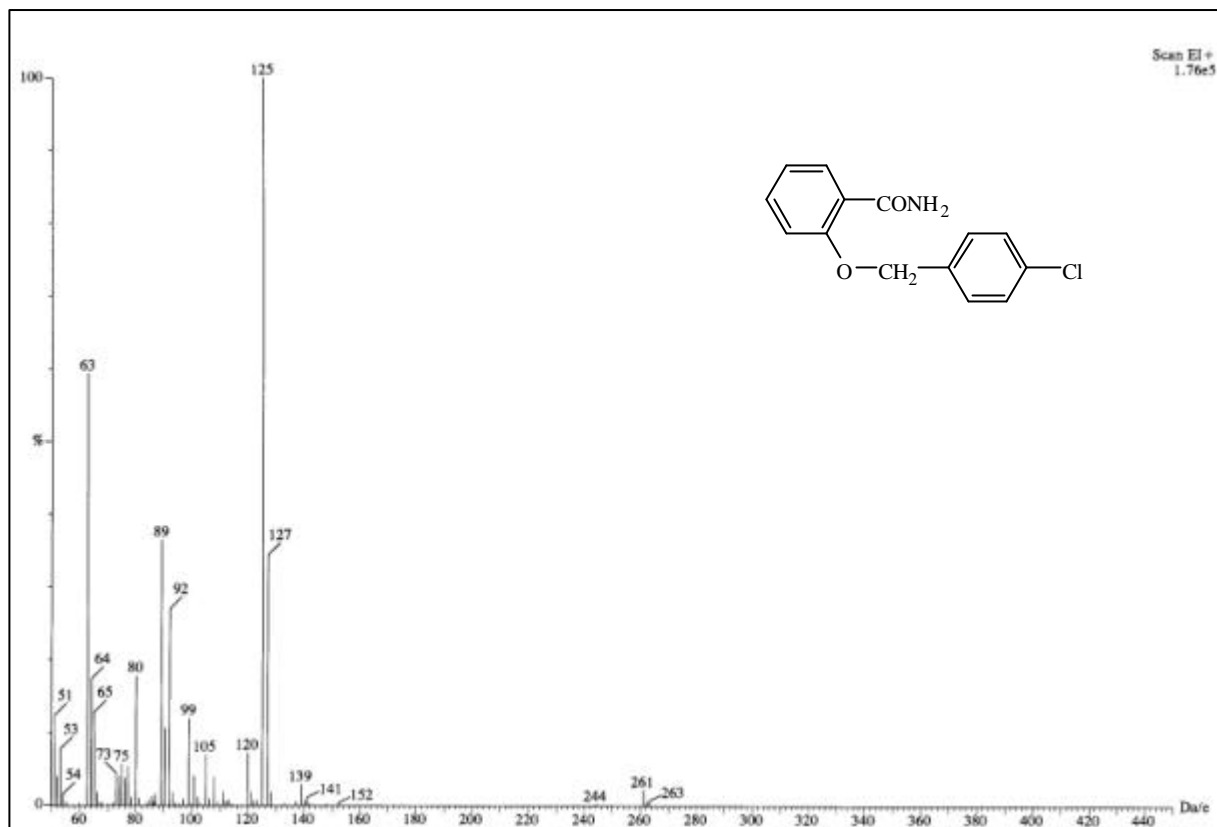


圖 44-1 MS spectrum of compound 44

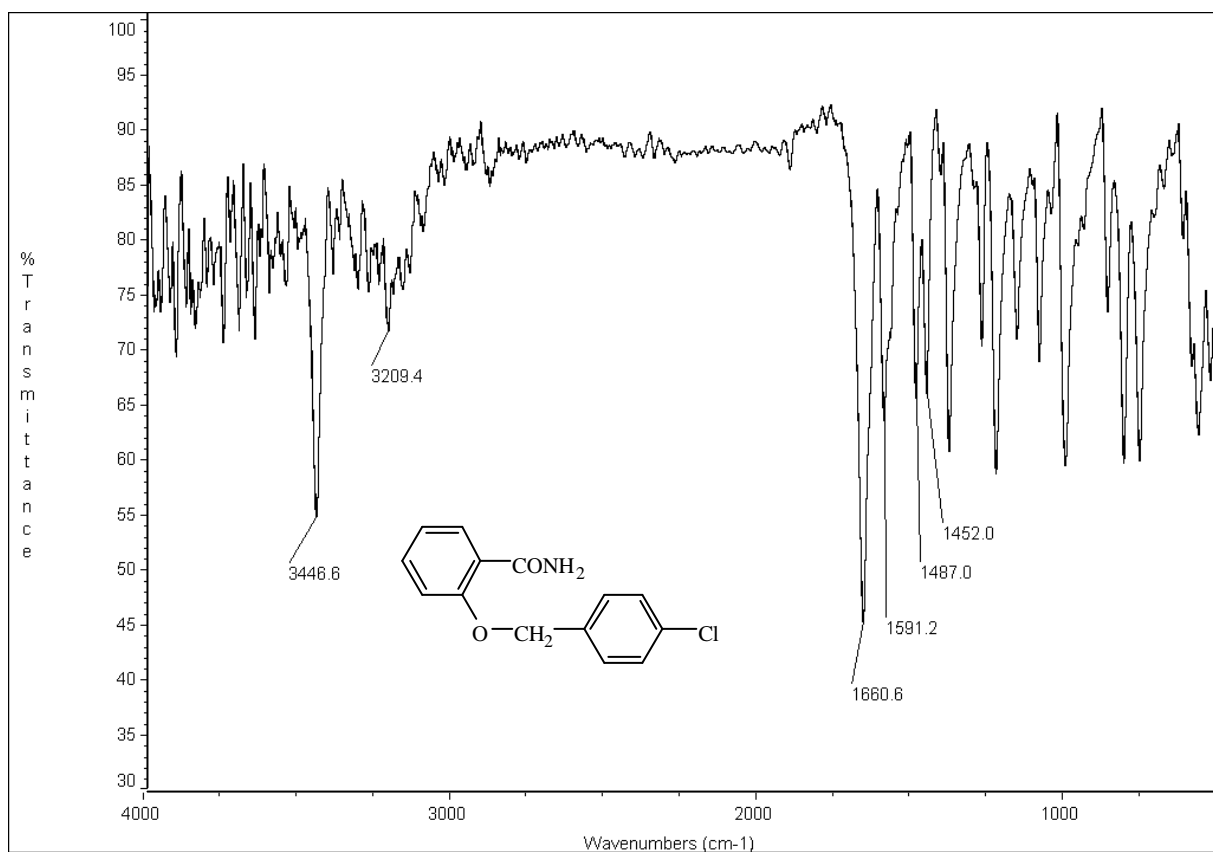


圖 44-2 IR (KBr) spectrum of compound 44

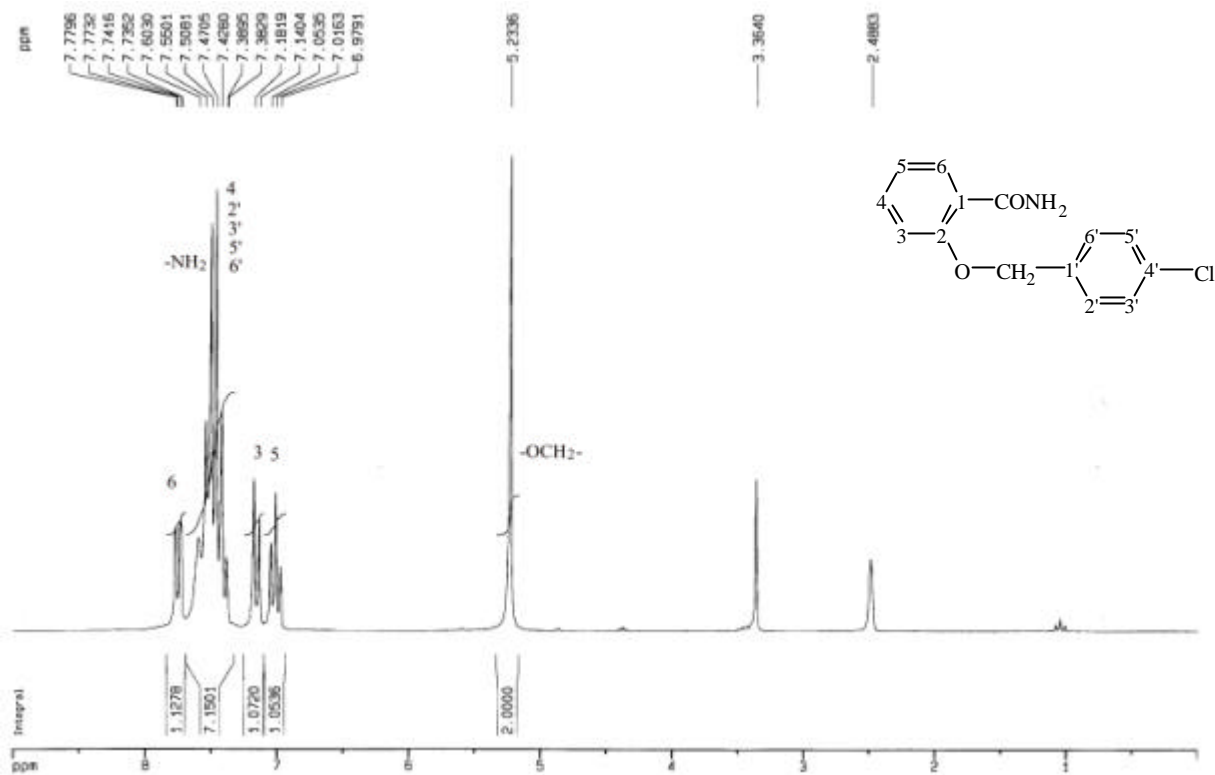


圖 44-3  $^1\text{H-NMR}$  ( $\text{DMSO-}d_6$ , 200 MHz) spectrum of compound **44**

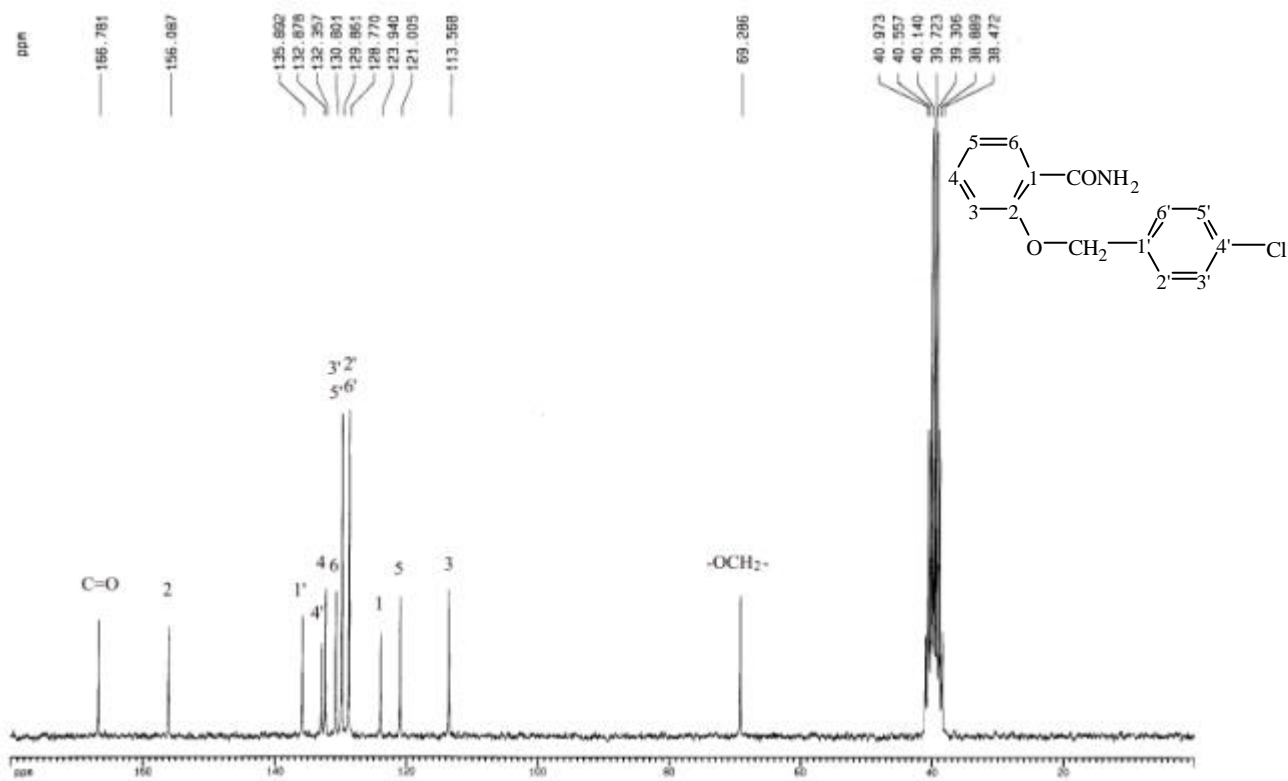


圖 44-4  $^{13}\text{C-NMR}$  ( $\text{DMSO-}d_6$ , 50 MHz) spectrum of compound **44**

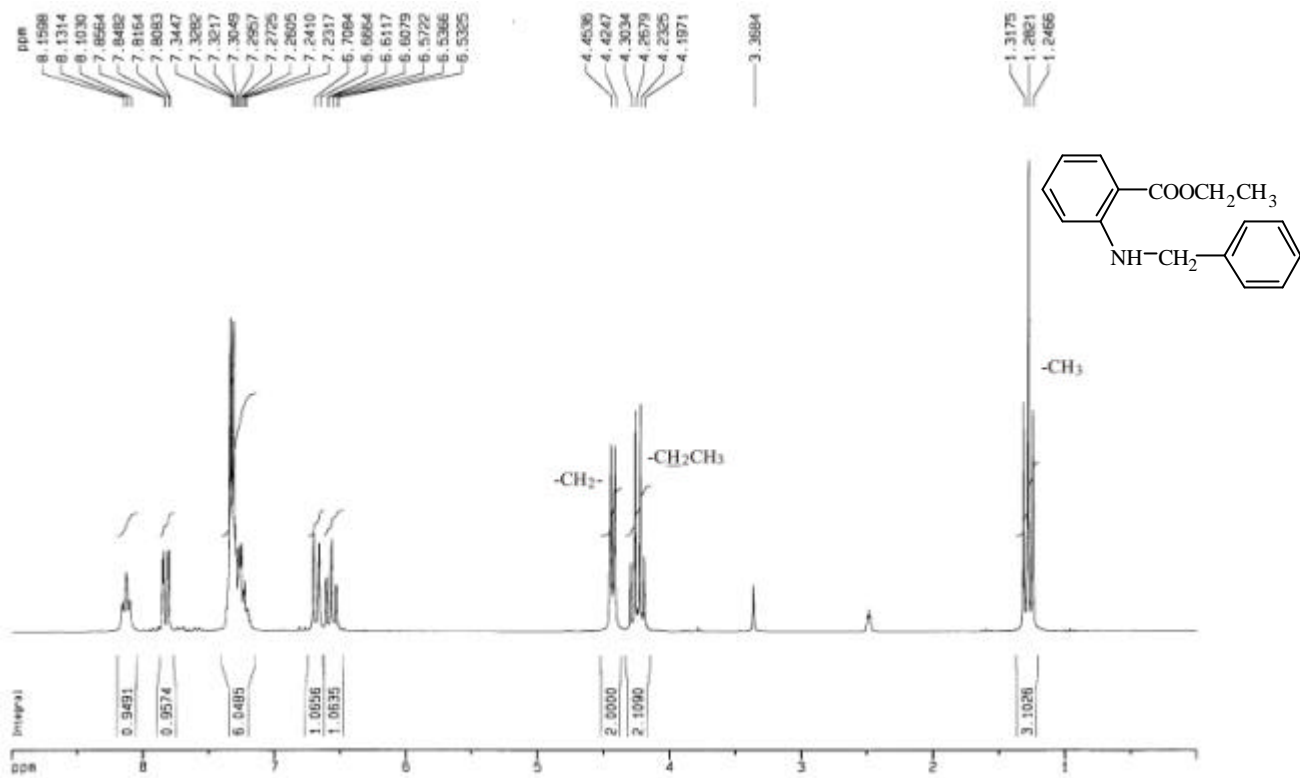


圖 45-1  $^1\text{H-NMR}$  ( $\text{DMSO-}d_6$ , 200 MHz) spectrum of compound **45**

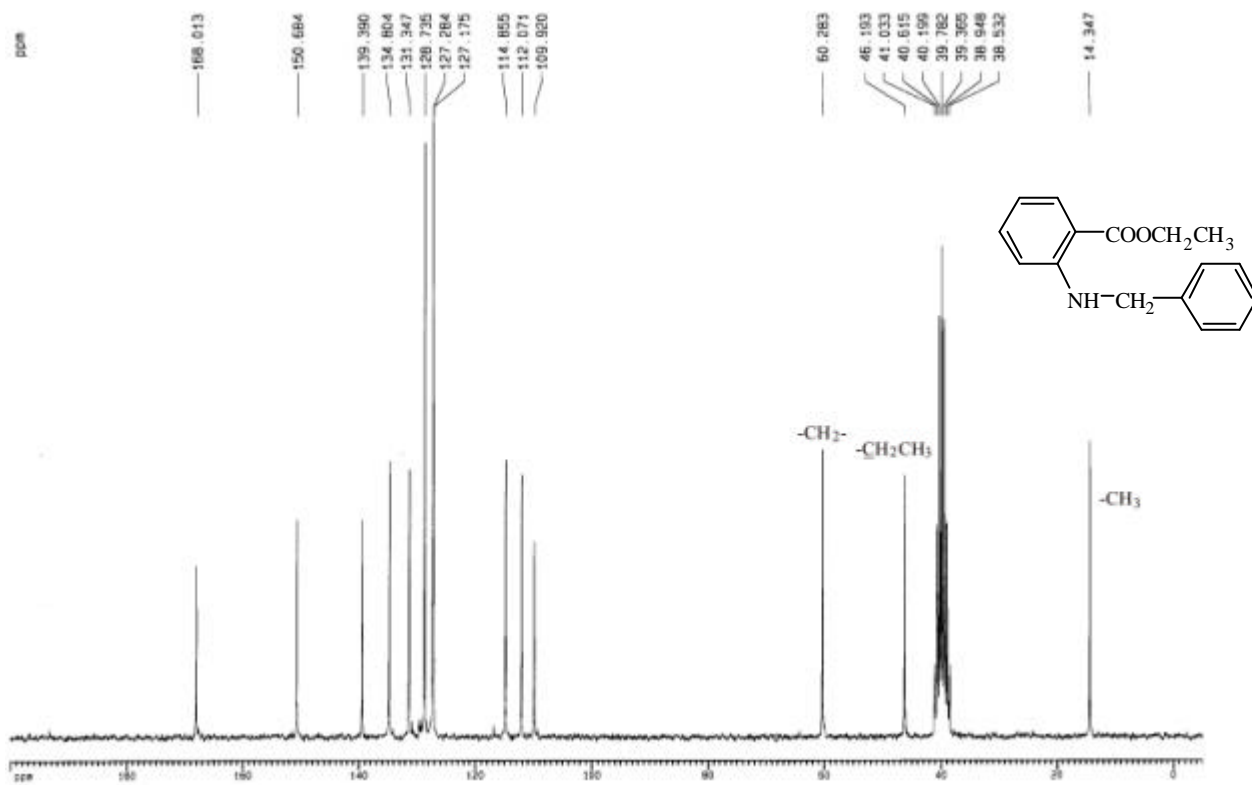


圖 45-2  $^{13}\text{C-NMR}$  ( $\text{DMSO-}d_6$ , 50 MHz) spectrum of compound **45**



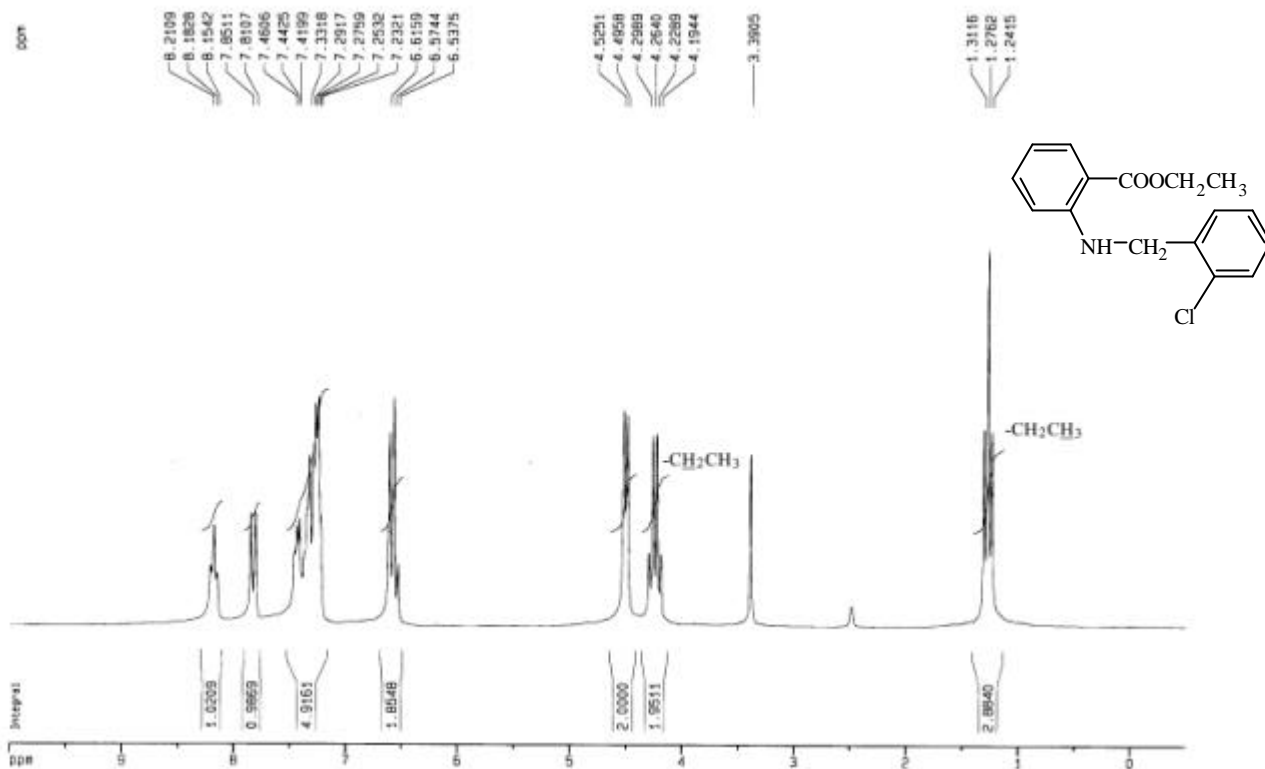


圖 46-1 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound 46

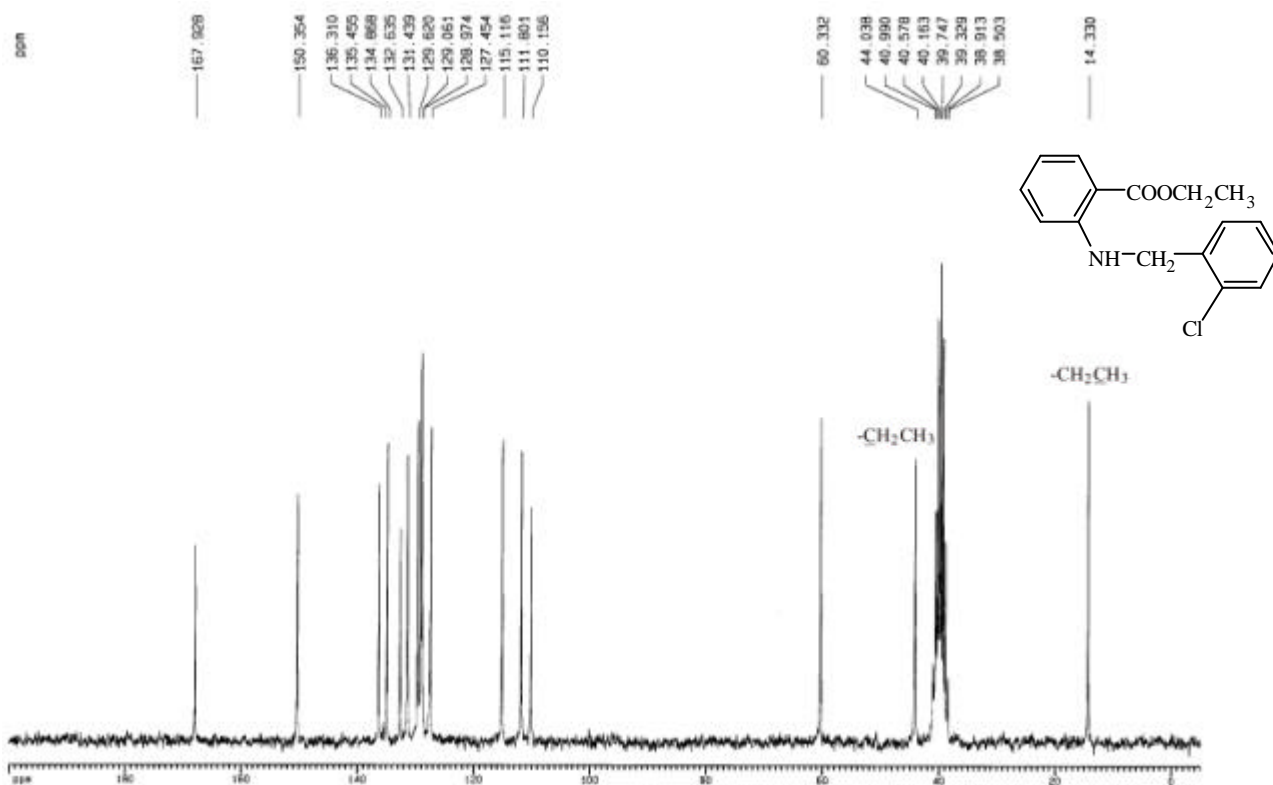


圖 46-2 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound 46

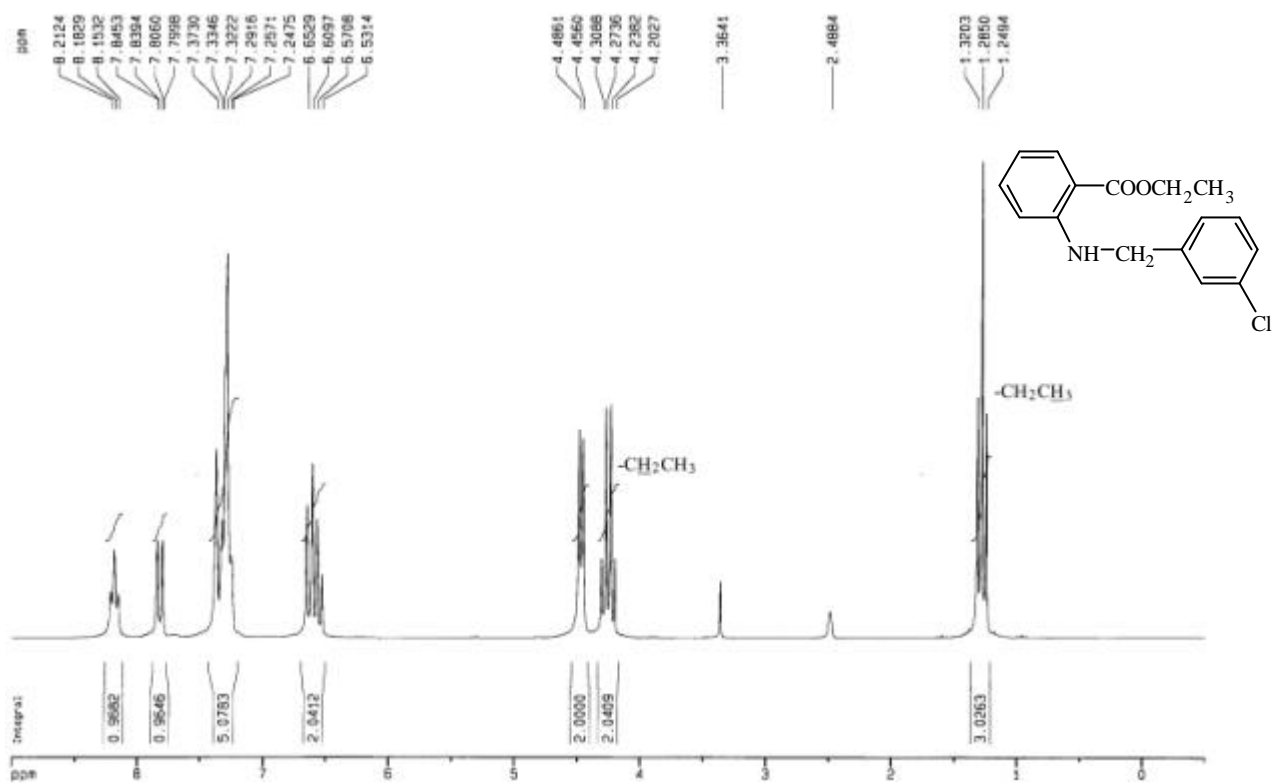


圖 47-1 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound 47

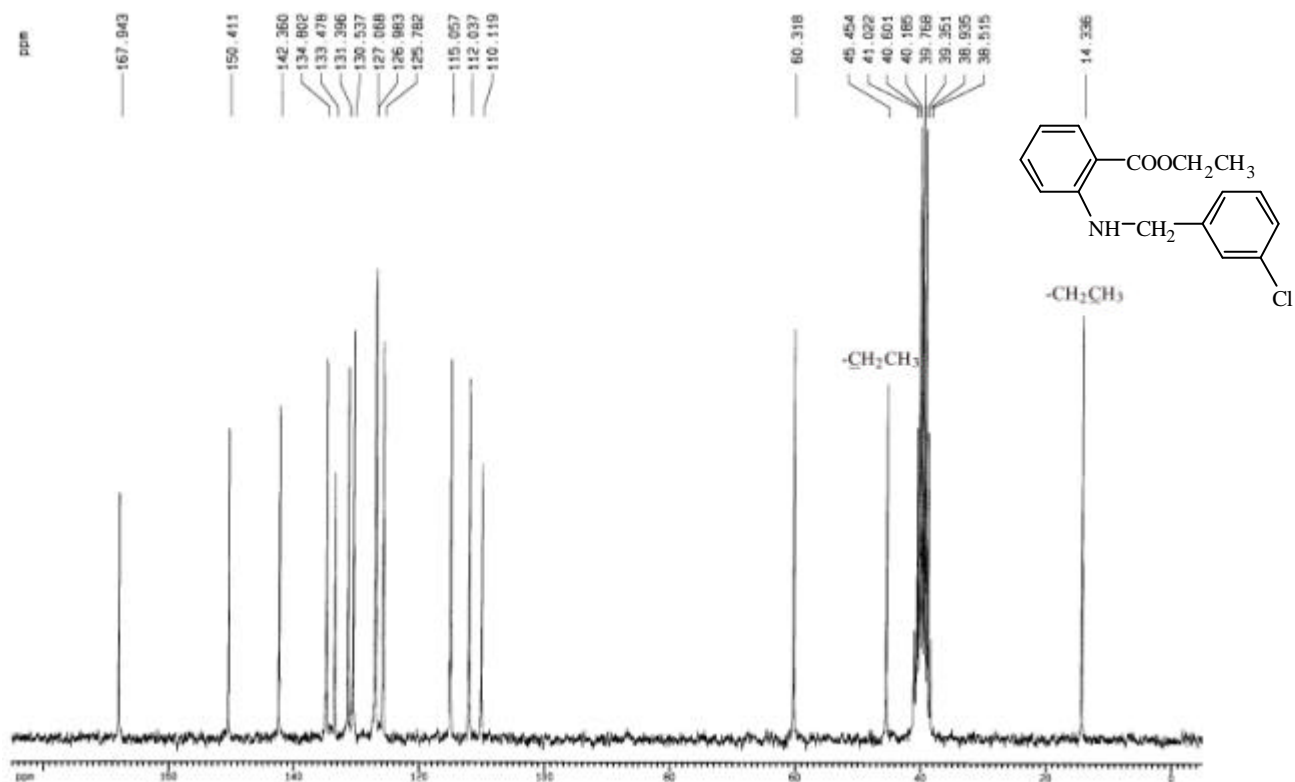


圖 47-2 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound 47

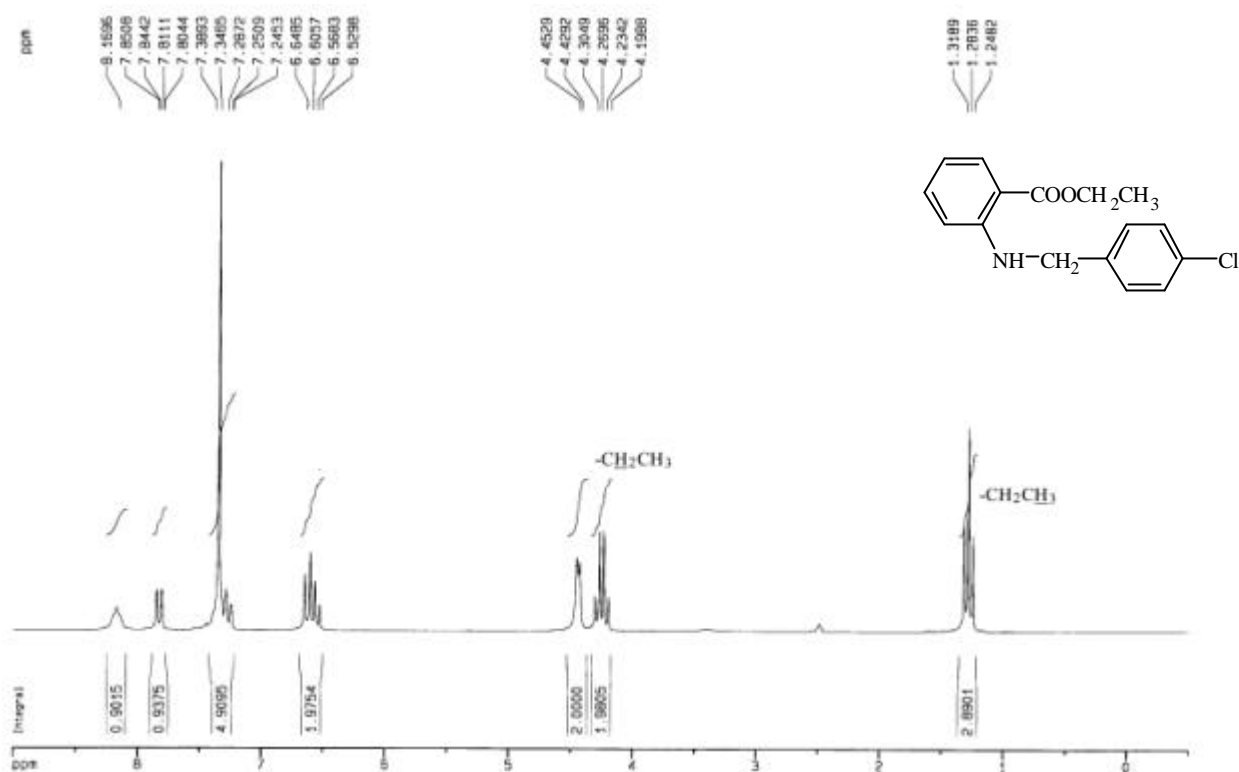


圖 48-1  $^1\text{H-NMR}$  ( $\text{DMSO-}d_6$ , 200 MHz) spectrum of compound 48

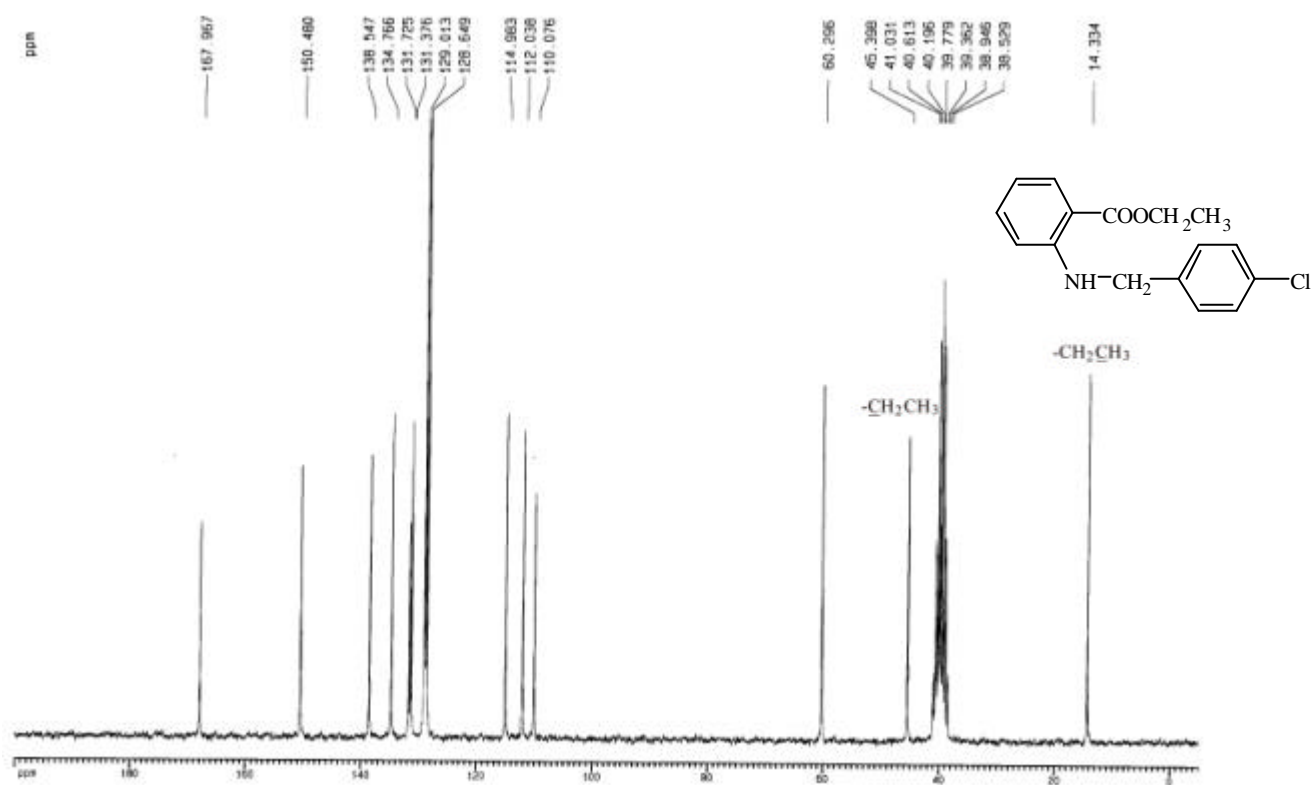


圖 48-2  $^{13}\text{C-NMR}$  ( $\text{DMSO-}d_6$ , 50 MHz) spectrum of compound 48

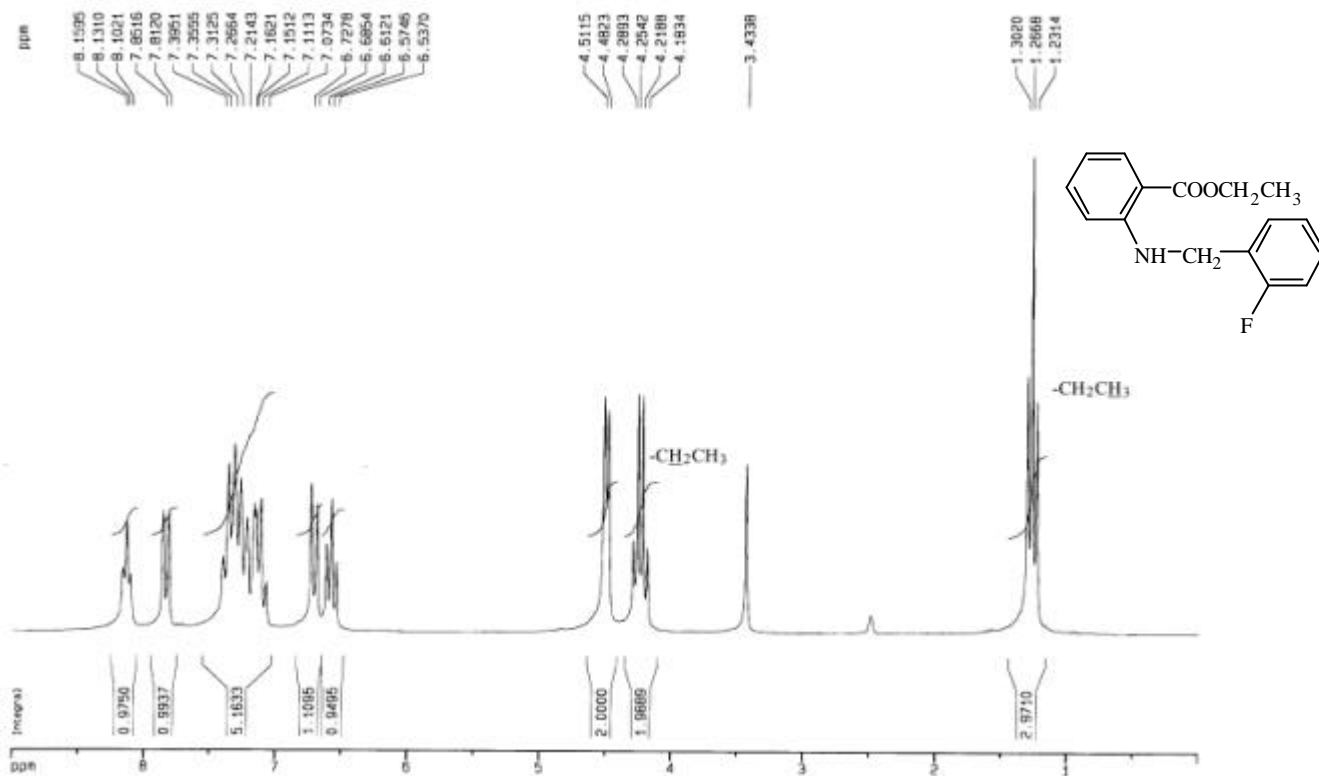


圖 49-1 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound 49

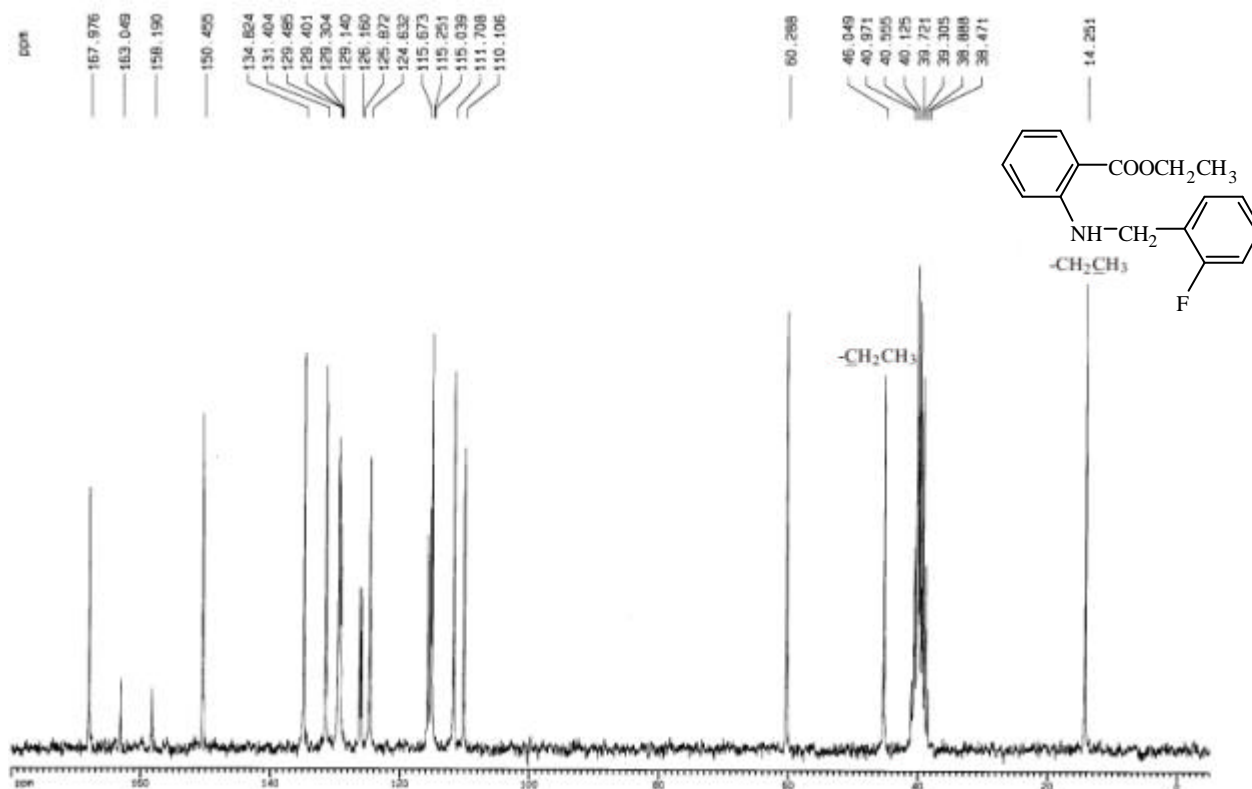


圖 49-2 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound 49

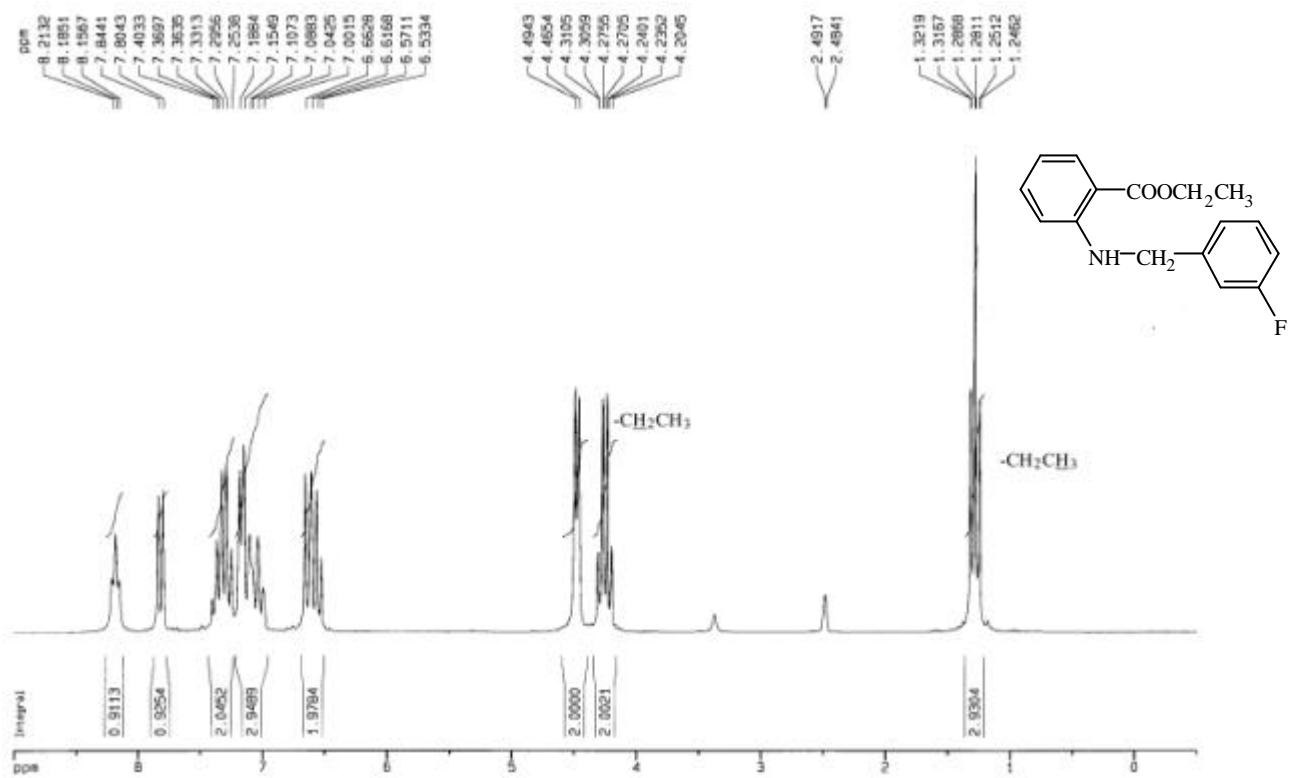


圖 50-1 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound **50**

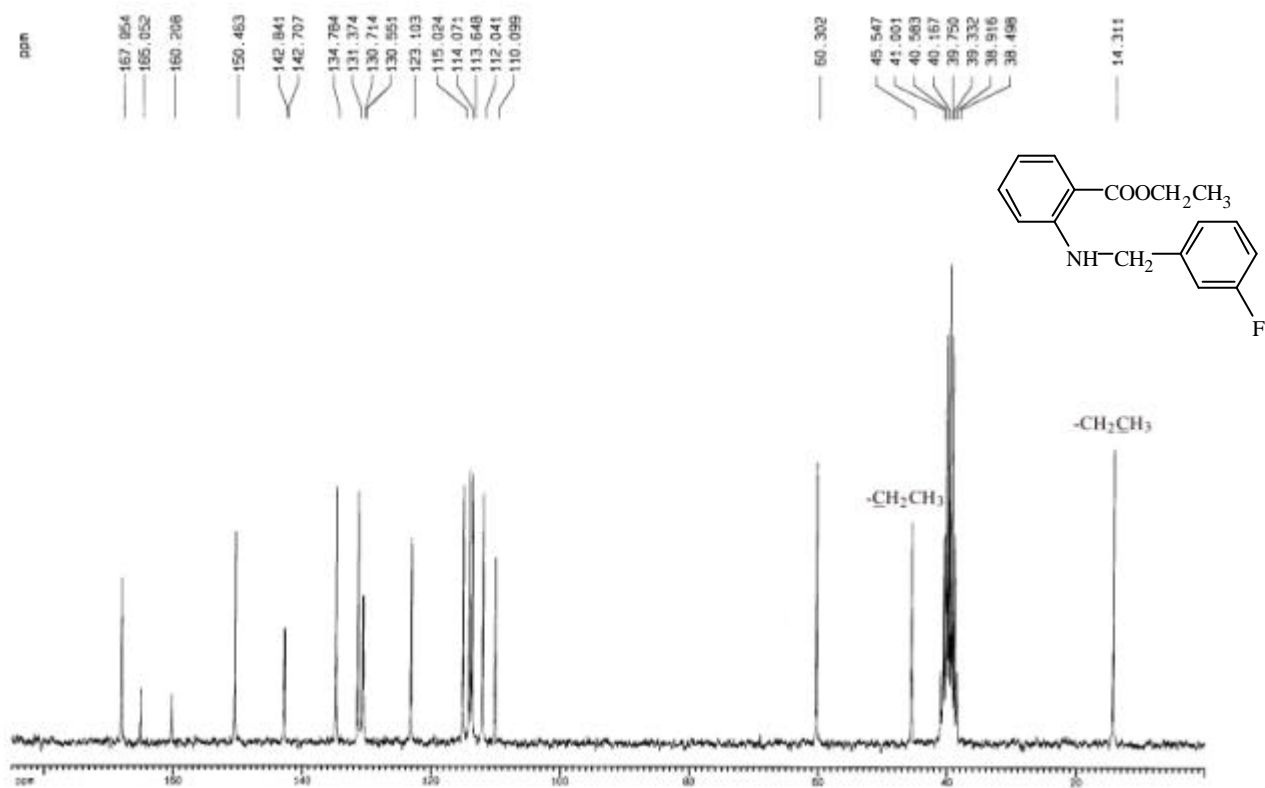


圖 50-2 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound **50**

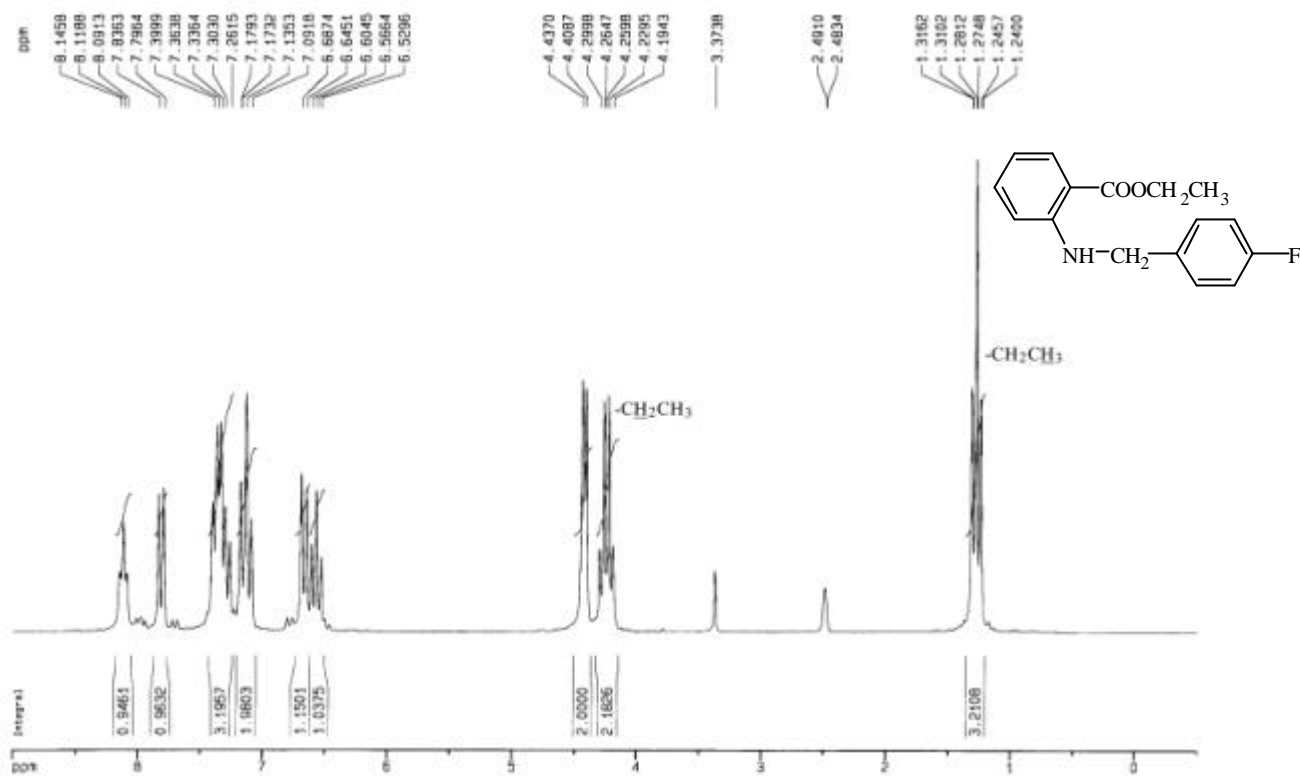


圖 51-1  $^1\text{H-NMR}$  (DMSO- $d_6$ , 200 MHz) spectrum of compound **51**

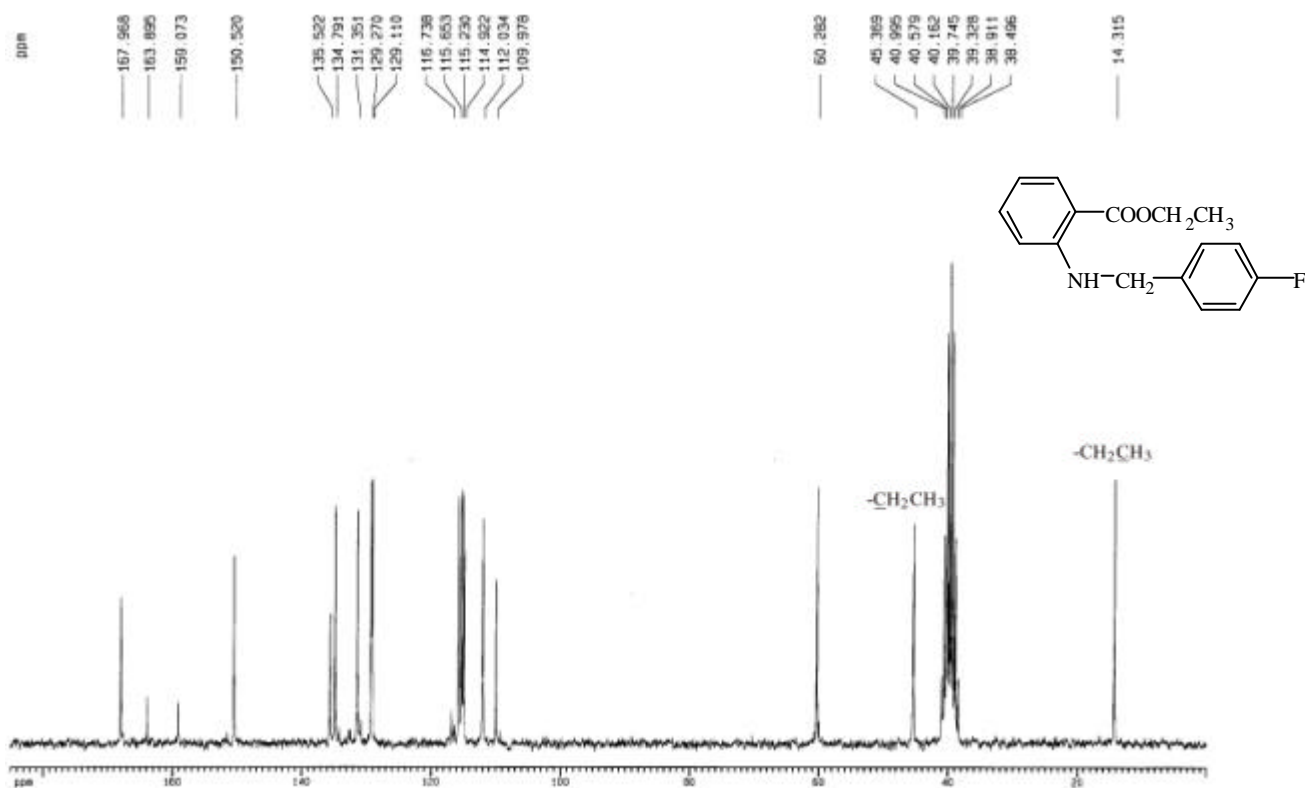


圖 51-2  $^{13}\text{C-NMR}$  (DMSO- $d_6$ , 50 MHz) spectrum of compound **51**

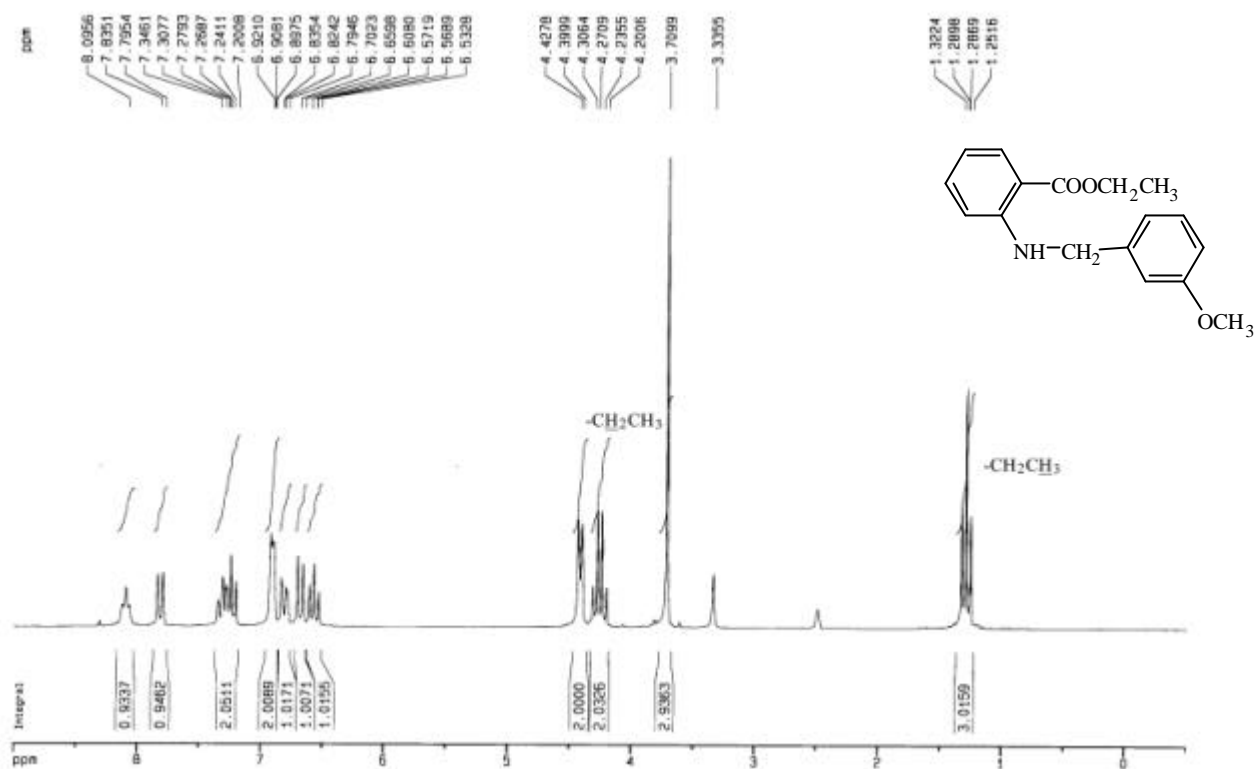


圖 52-1 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound 52

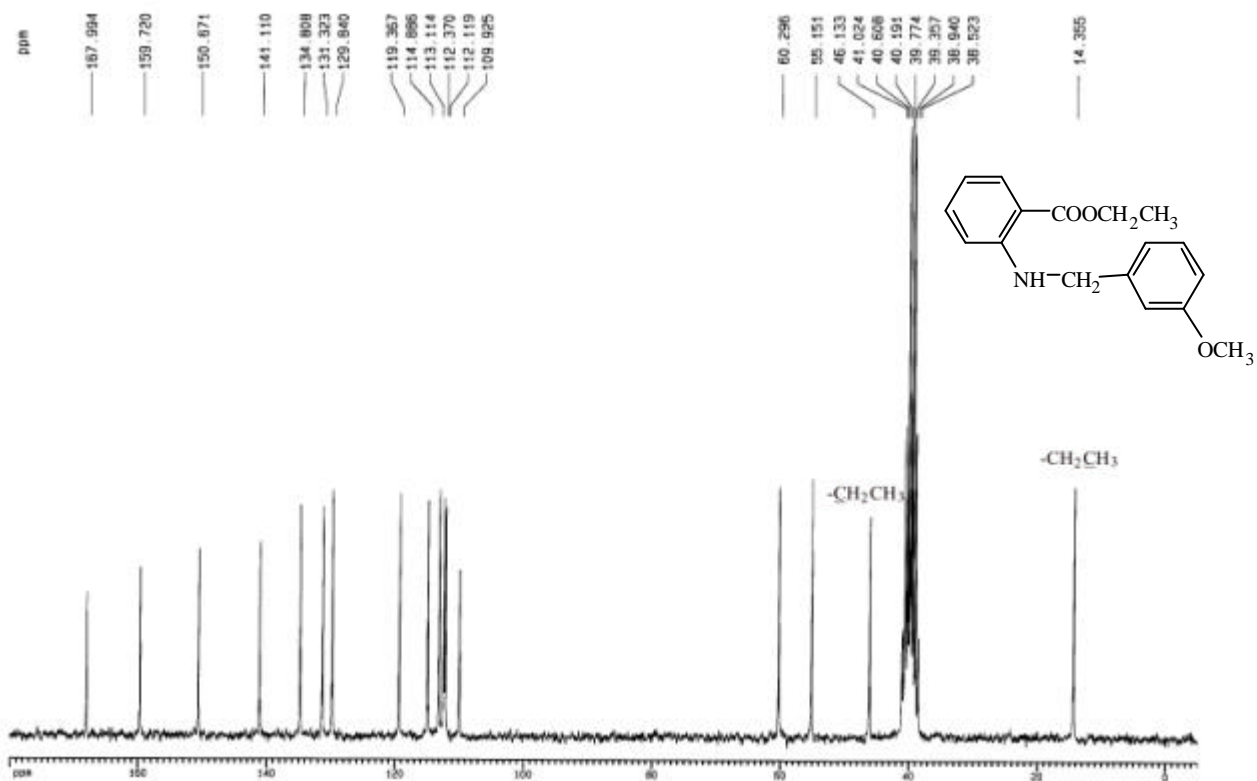


圖 52-2 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound 52

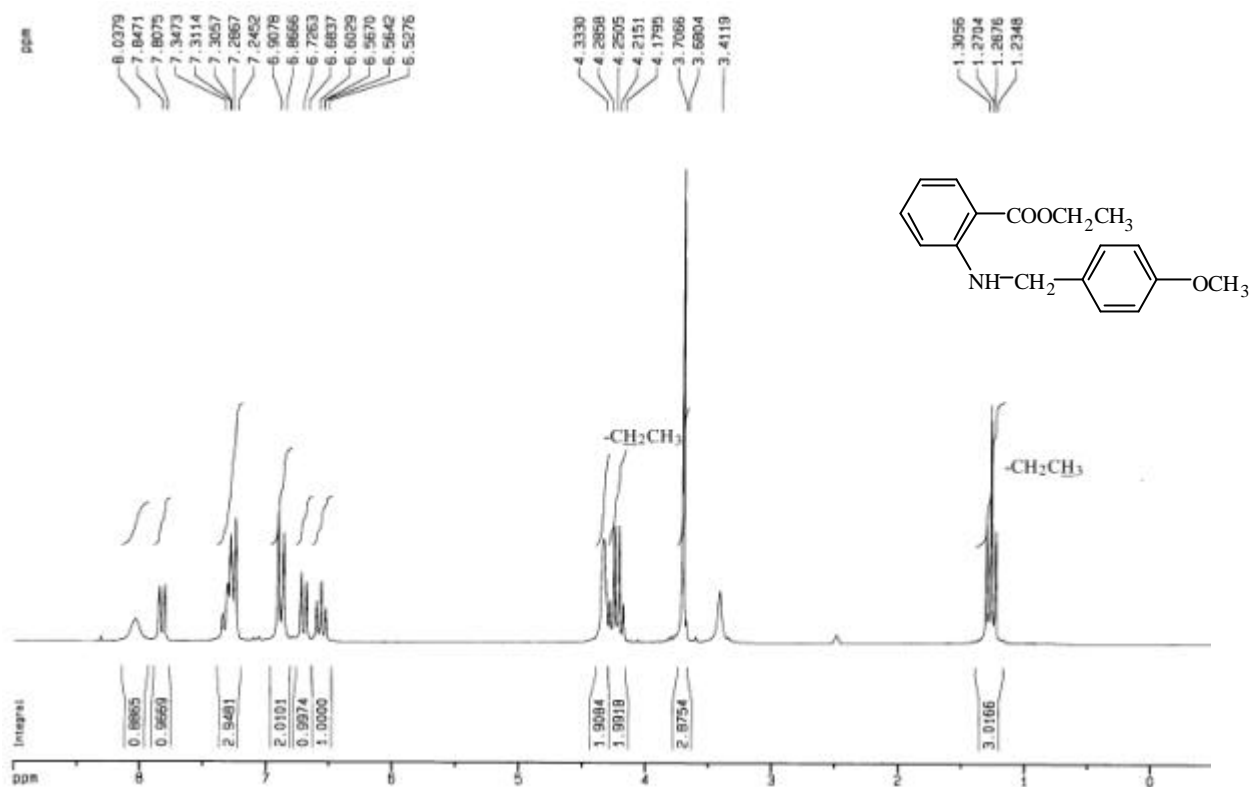


圖 53-1  $^1\text{H-NMR}$  ( $\text{DMSO-}d_6$ , 200 MHz) spectrum of compound **53**

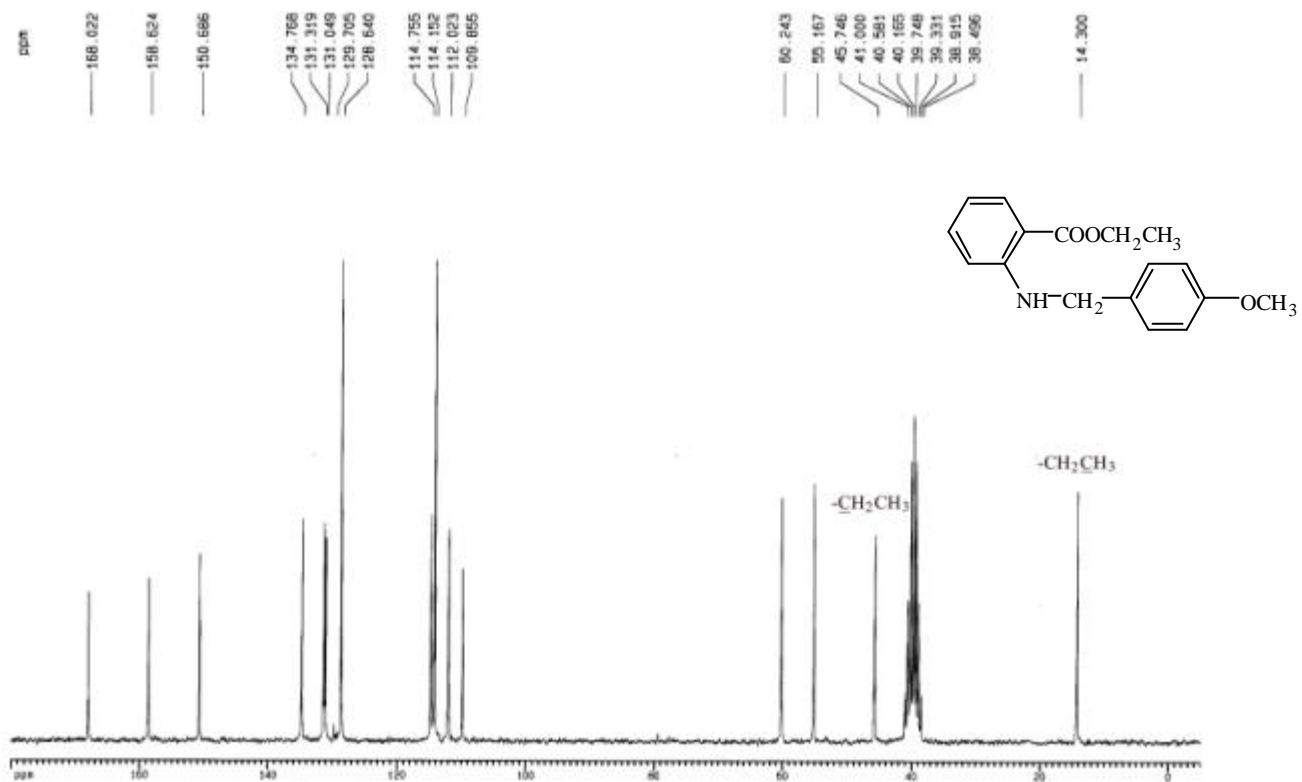


圖 53-2  $^{13}\text{C-NMR}$  ( $\text{DMSO-}d_6$ , 50 MHz) spectrum of compound **53**



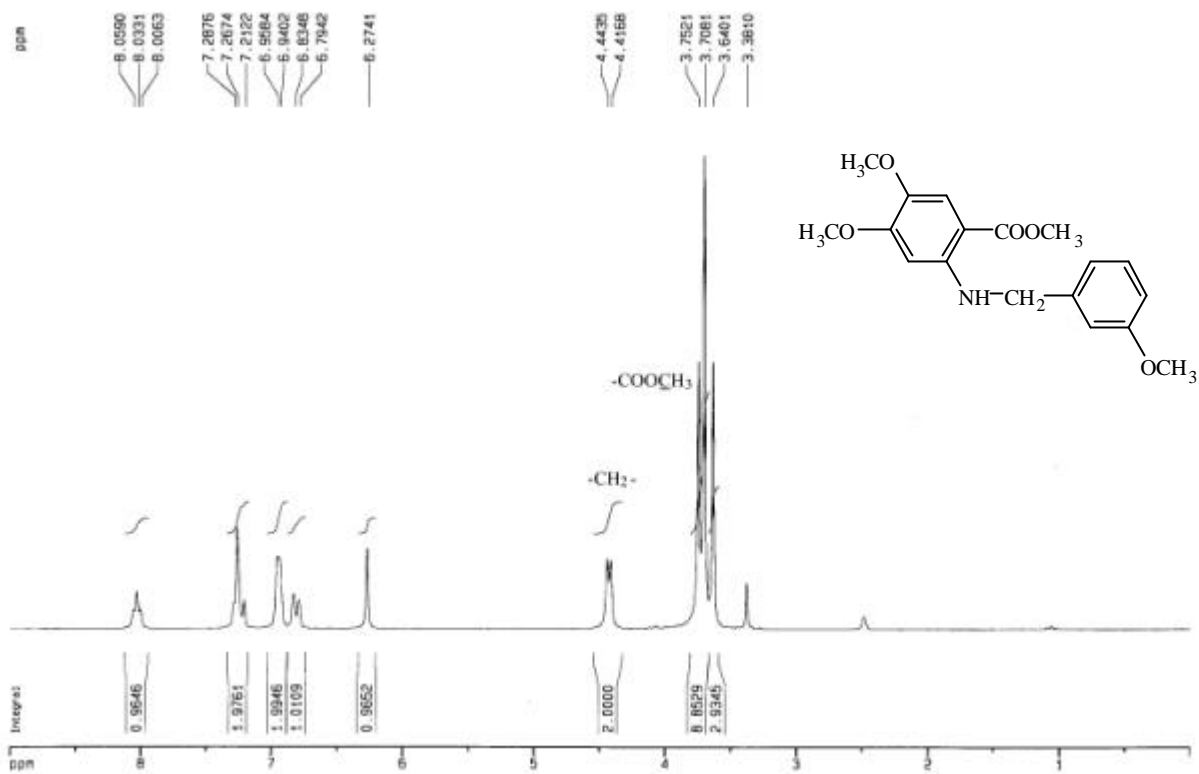


圖 54-1  $^1\text{H-NMR}$  ( $\text{DMSO-}d_6$ , 200 MHz) spectrum of compound **54**

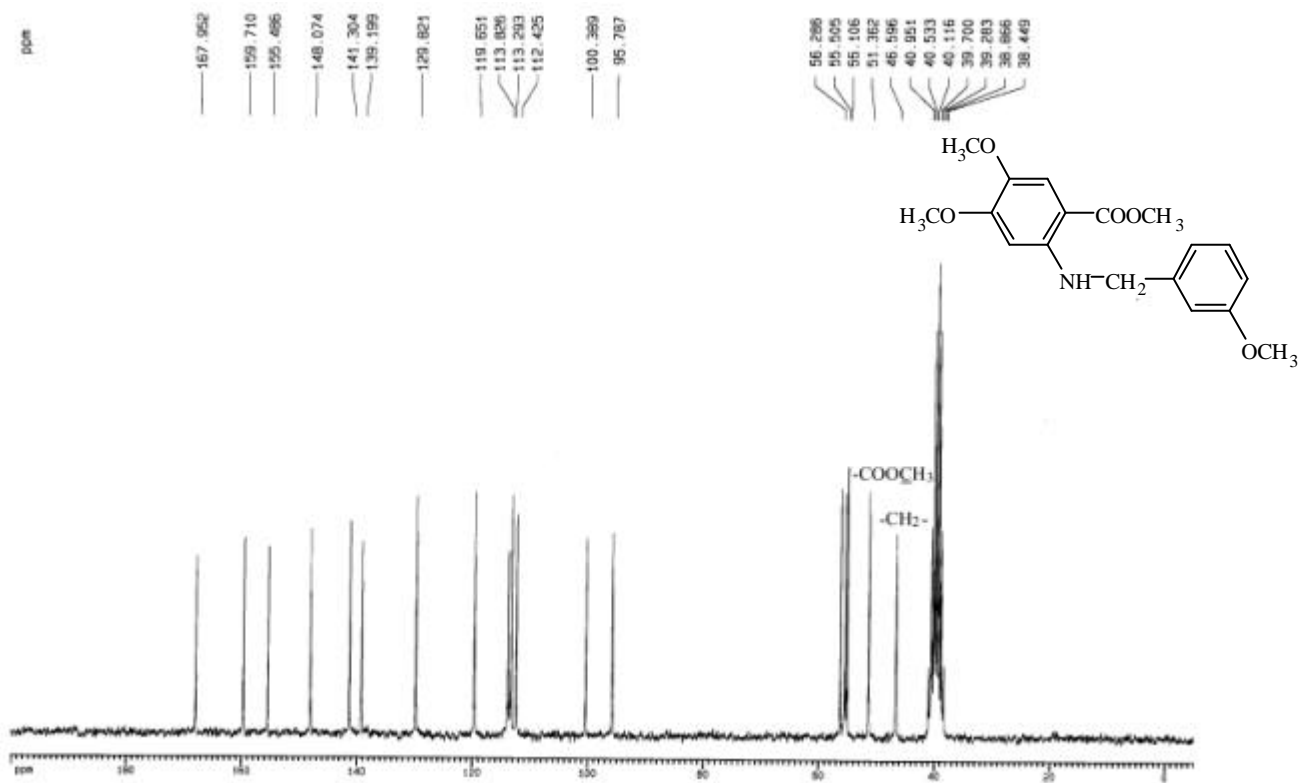


圖 54-2  $^{13}\text{C-NMR}$  ( $\text{DMSO-}d_6$ , 50 MHz) spectrum of compound **54**

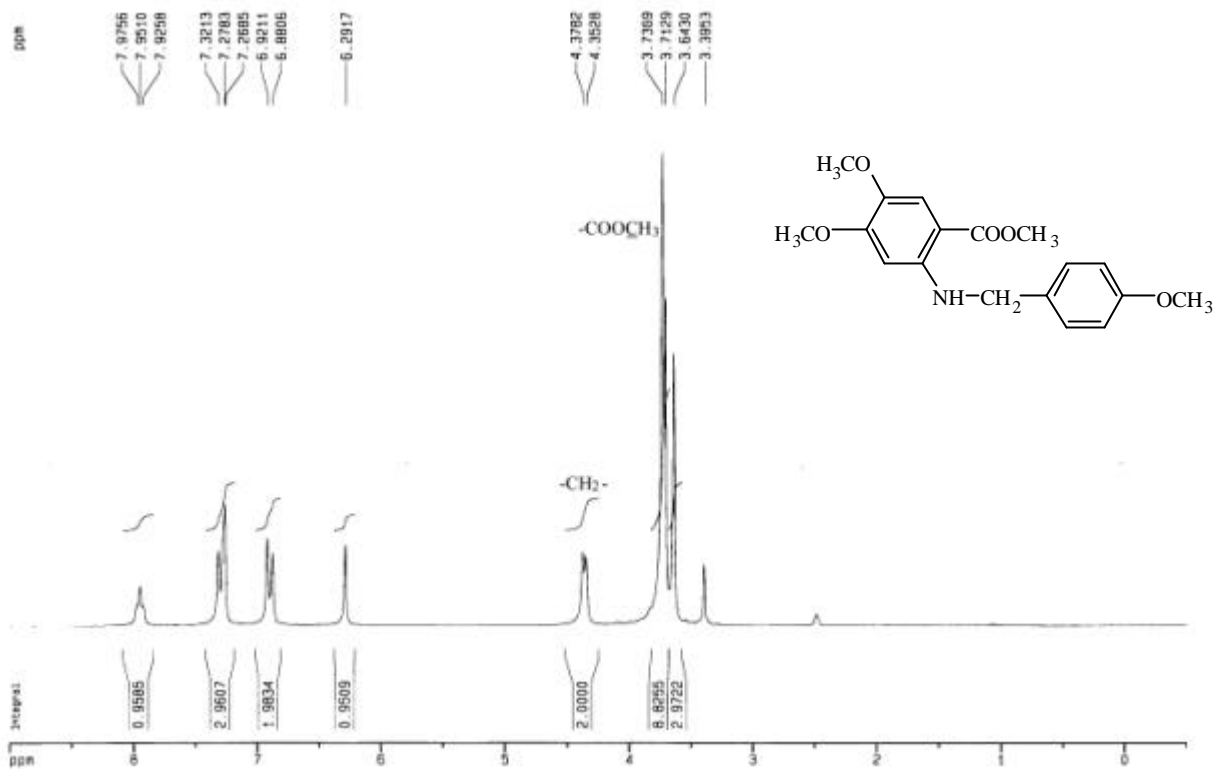


圖 55-1  $^1\text{H-NMR}$  ( $\text{DMSO-}d_6$ , 200 MHz) spectrum of compound **55**

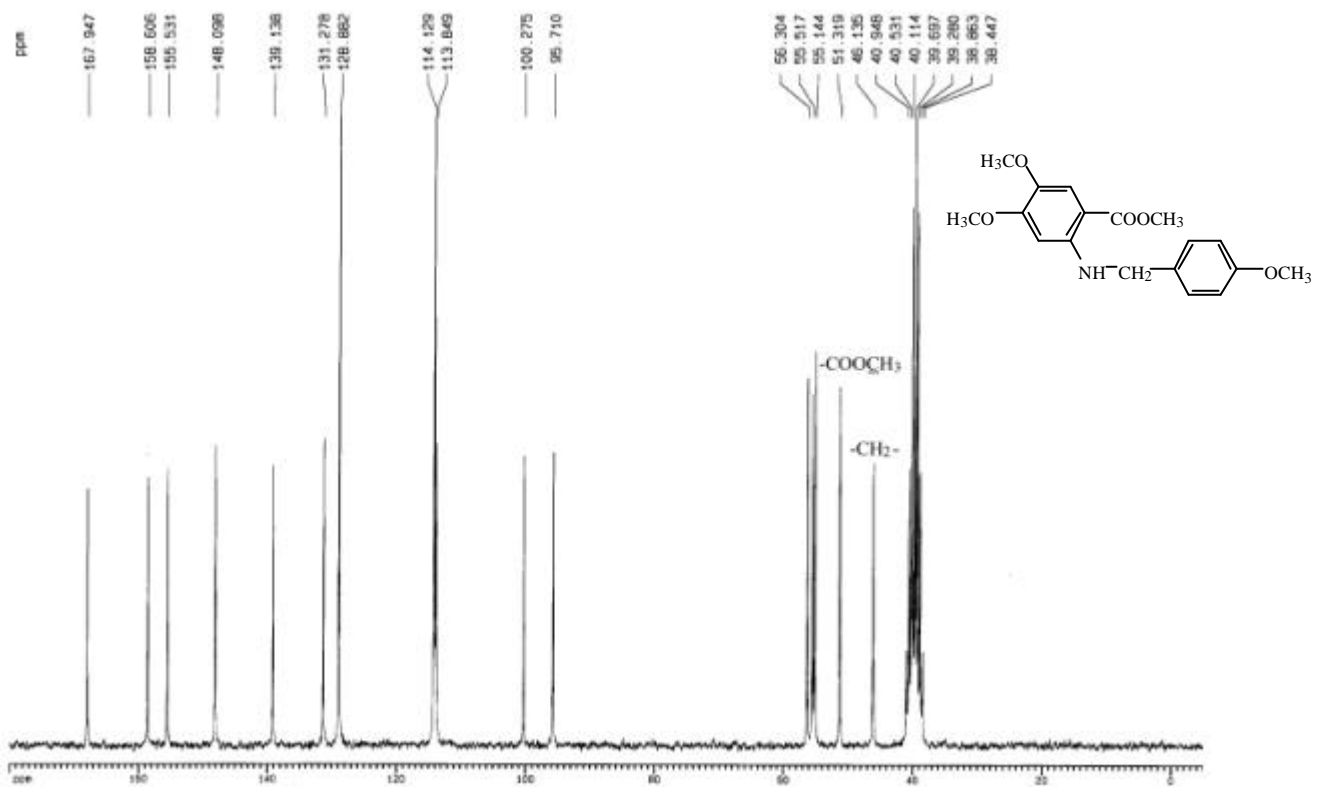


圖 55-2  $^{13}\text{C-NMR}$  ( $\text{DMSO-}d_6$ , 50 MHz) spectrum of compound **55**

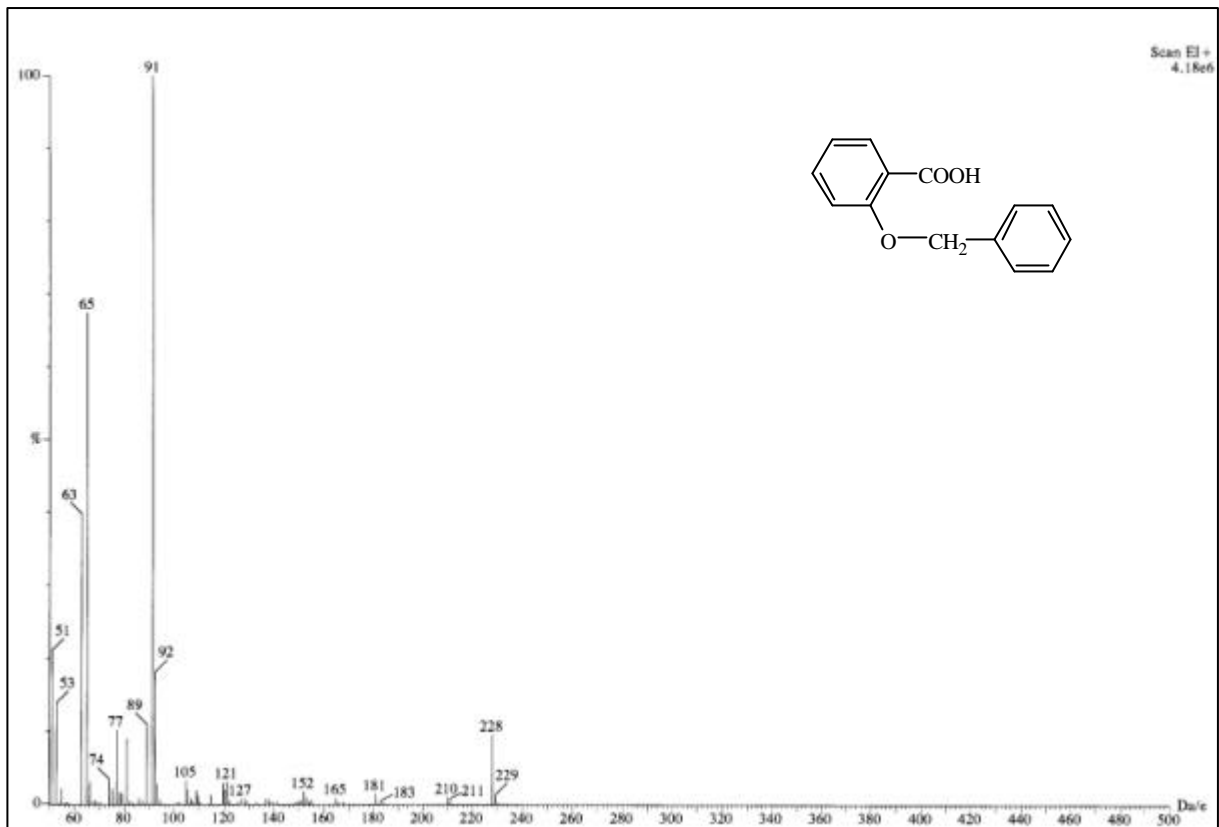


圖 56-1 MS spectrum of compound **56**

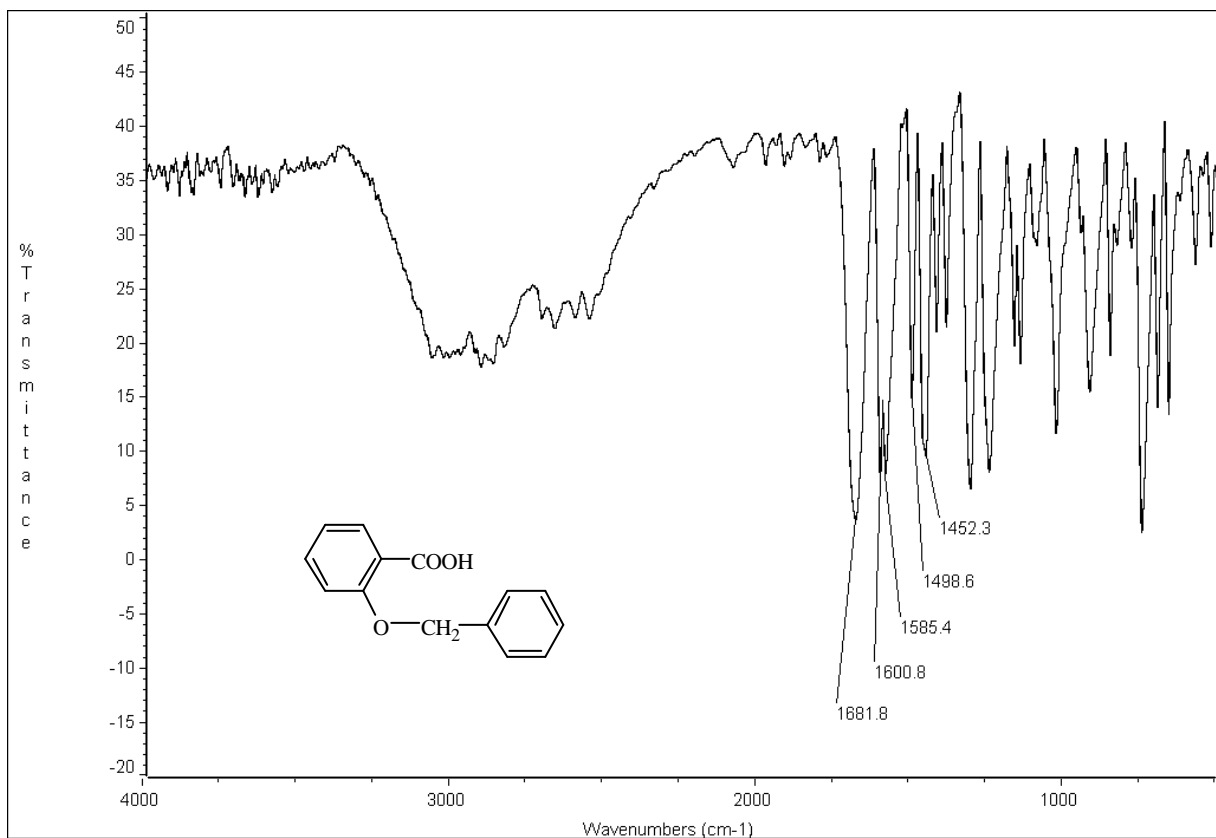


圖 56-2 IR (KBr) spectrum of compound **56**

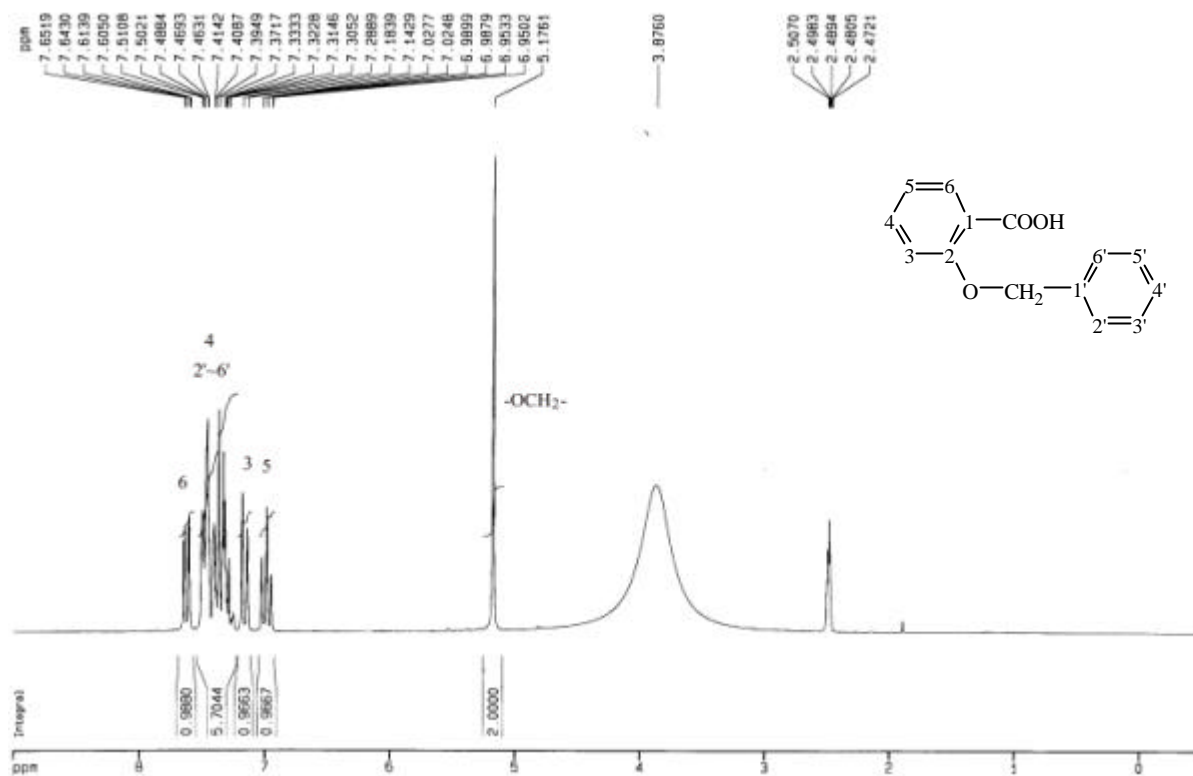


圖 56-3 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound **56**

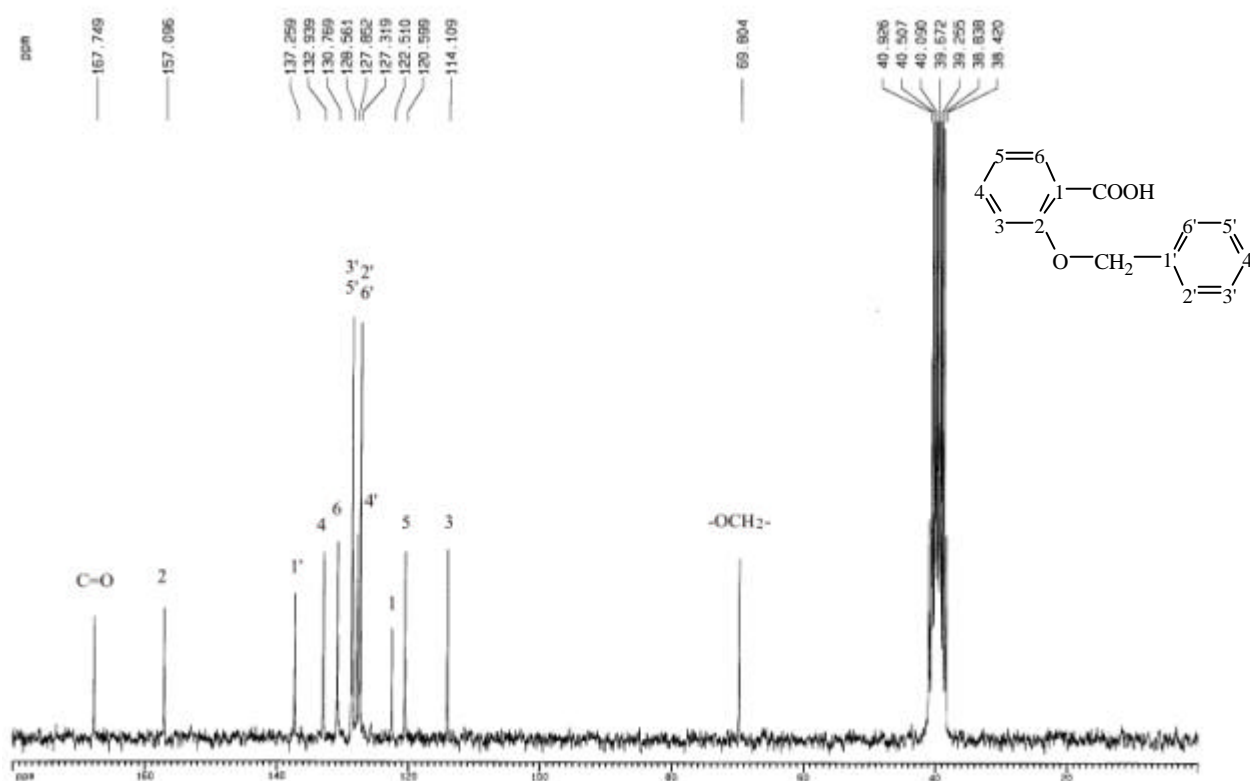


圖 56-4 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound **56**

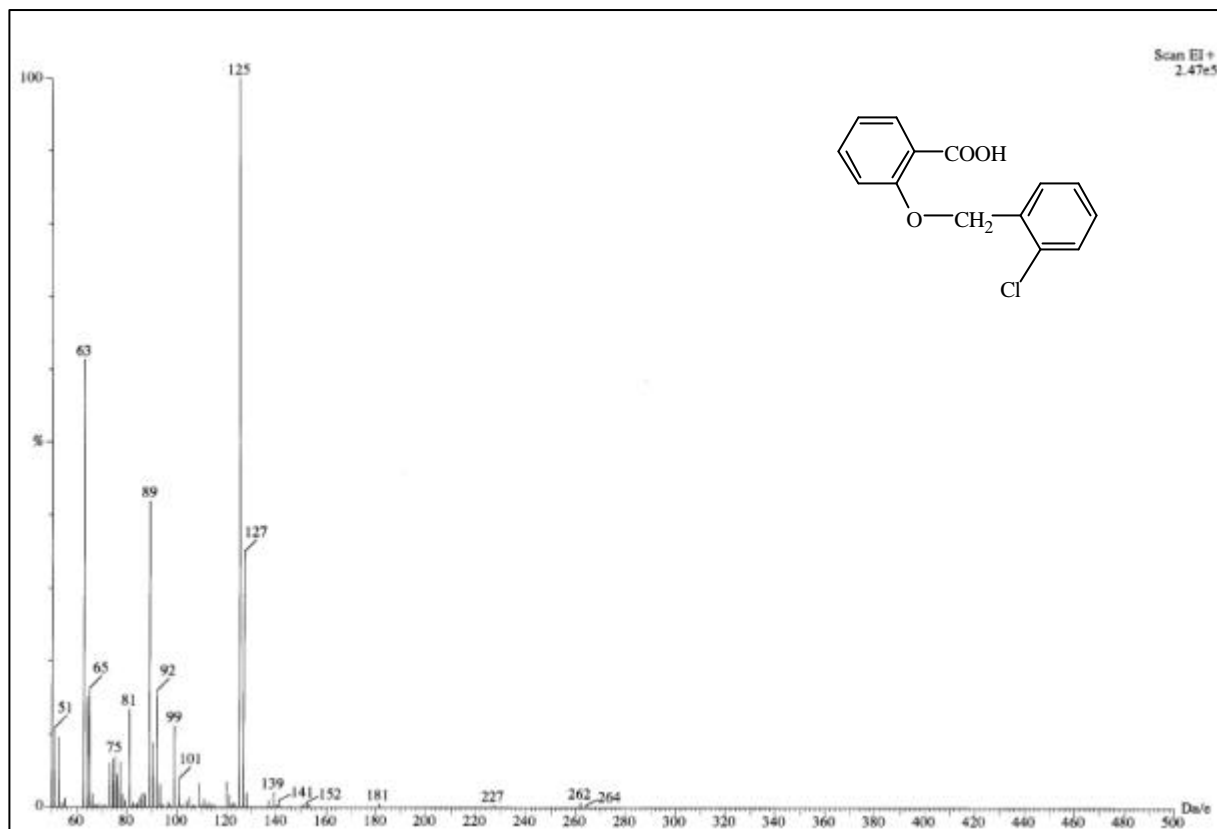


圖 57-1 MS spectrum of compound **57**

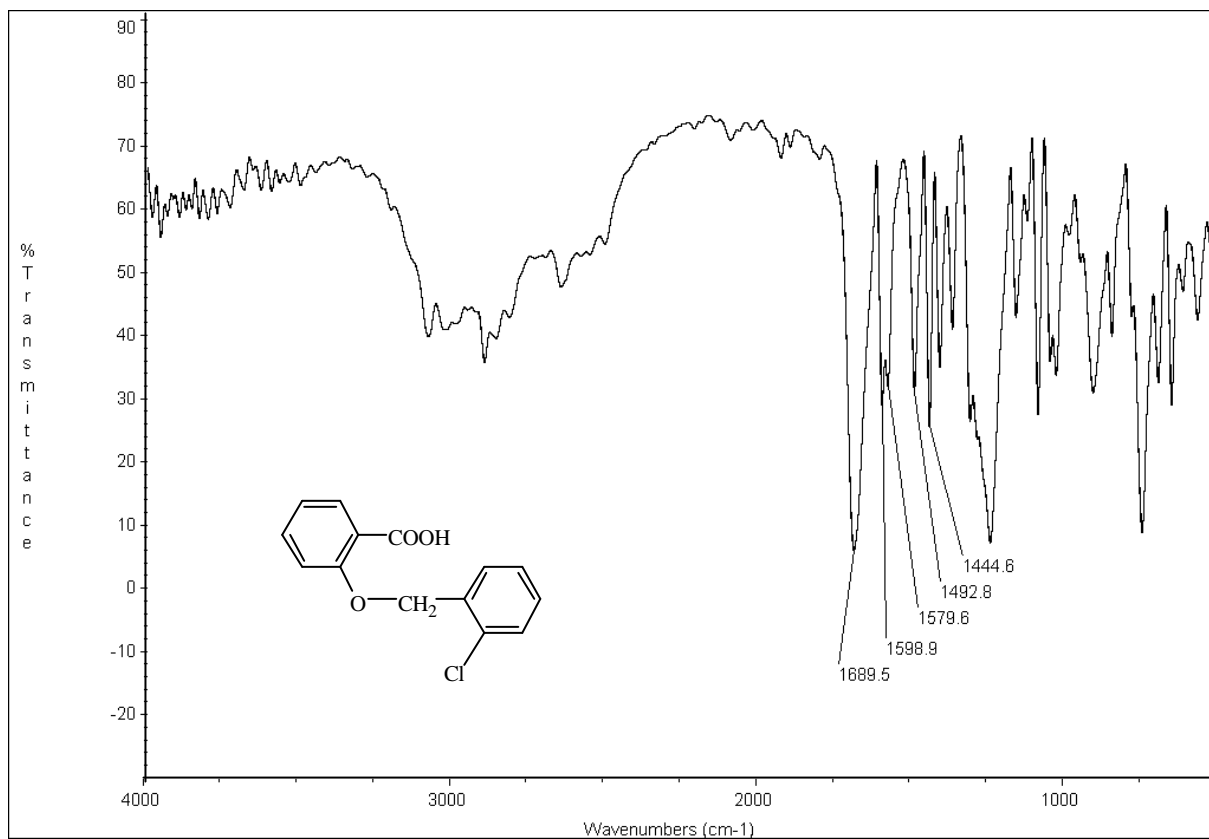


圖 57-2 IR (KBr) spectrum of compound **57**

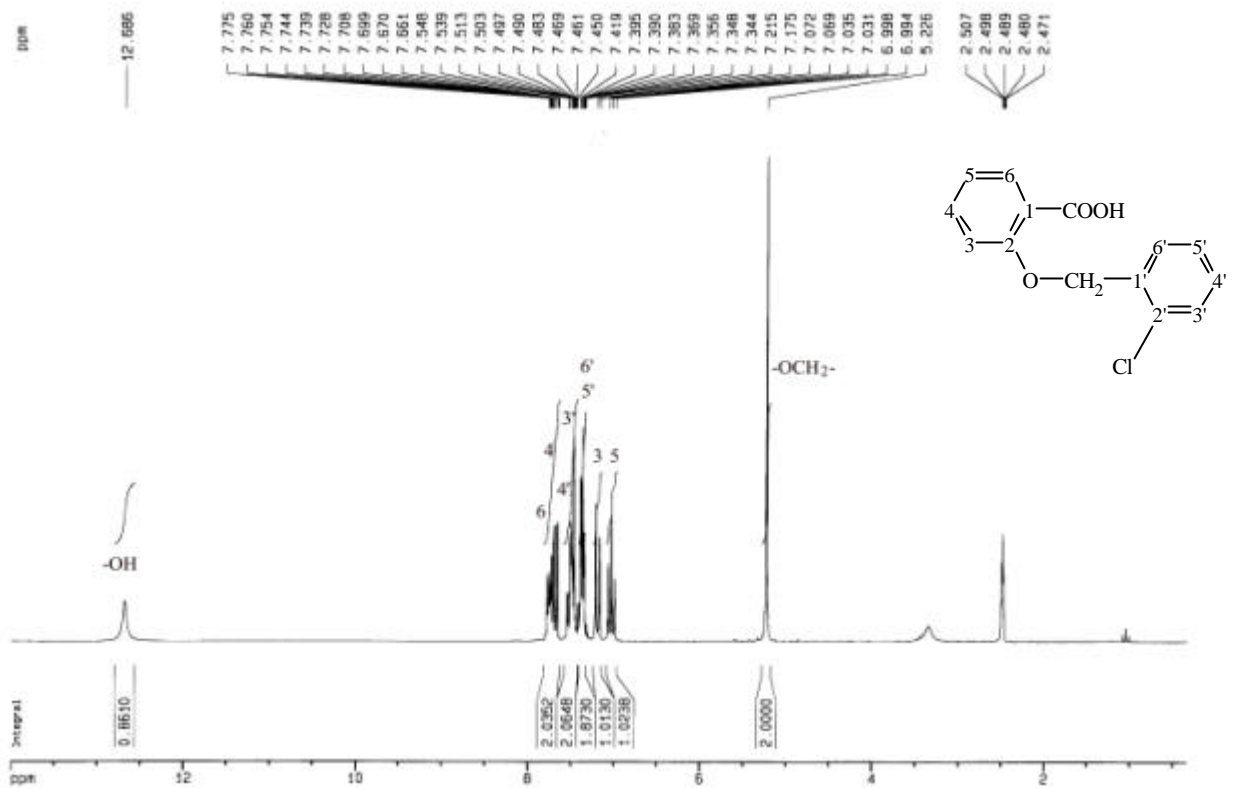


圖 57-3  $^1\text{H-NMR}$  ( $\text{DMSO-}d_6$ , 200 MHz) spectrum of compound **57**

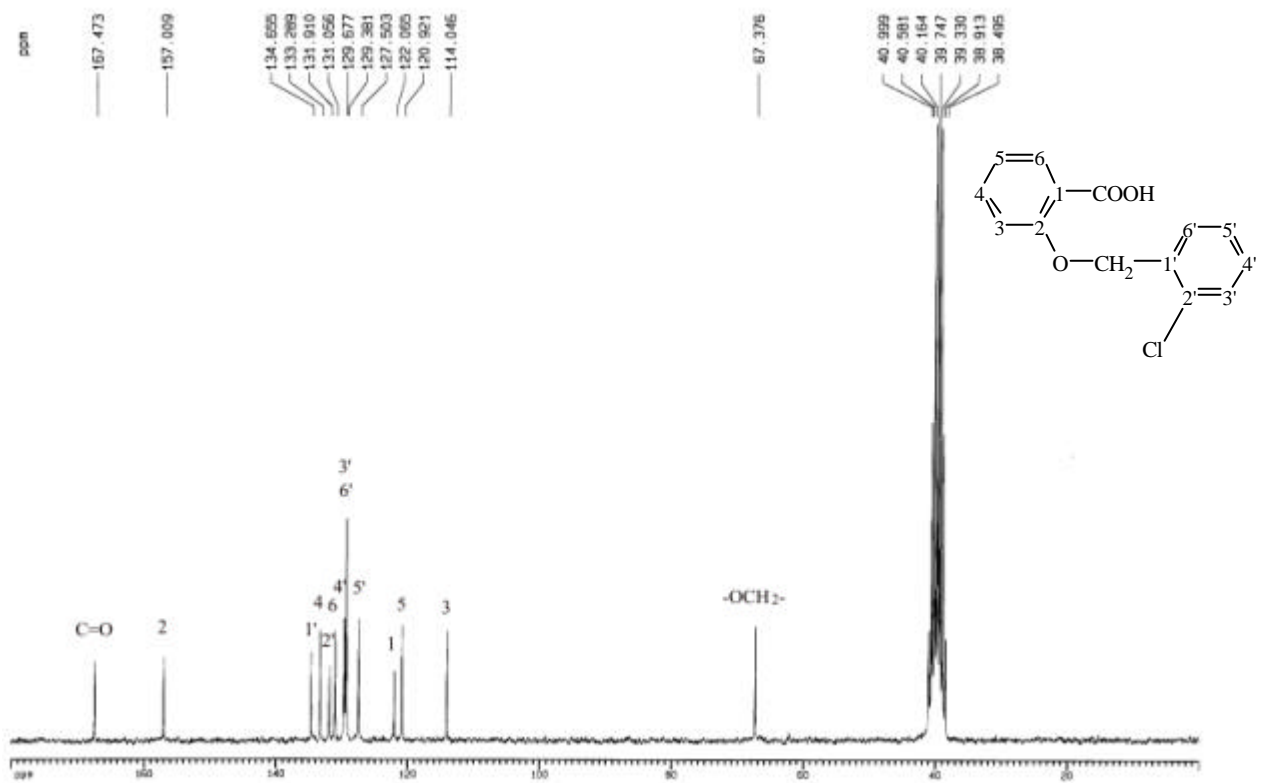


圖 57-4  $^{13}\text{C-NMR}$  ( $\text{DMSO-}d_6$ , 50 MHz) spectrum of compound **57**

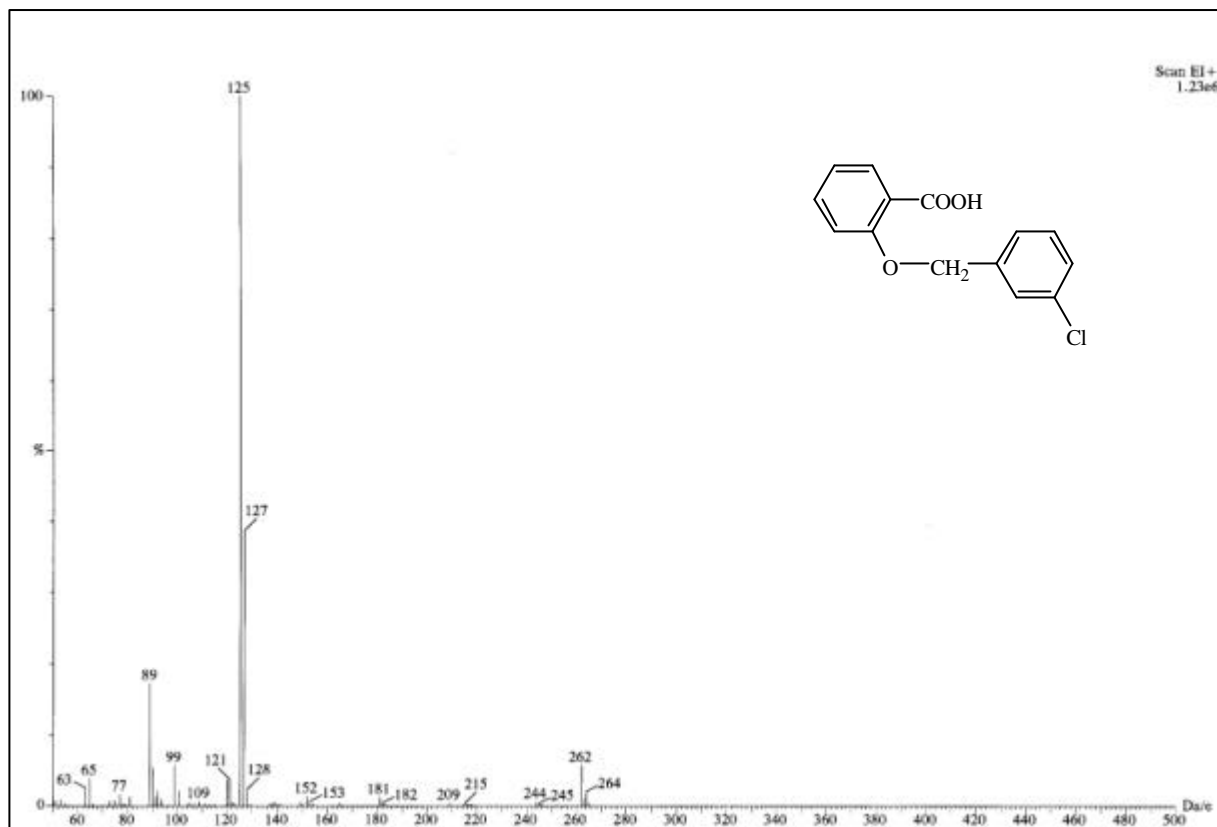


圖 58-1 MS spectrum of compound **58**

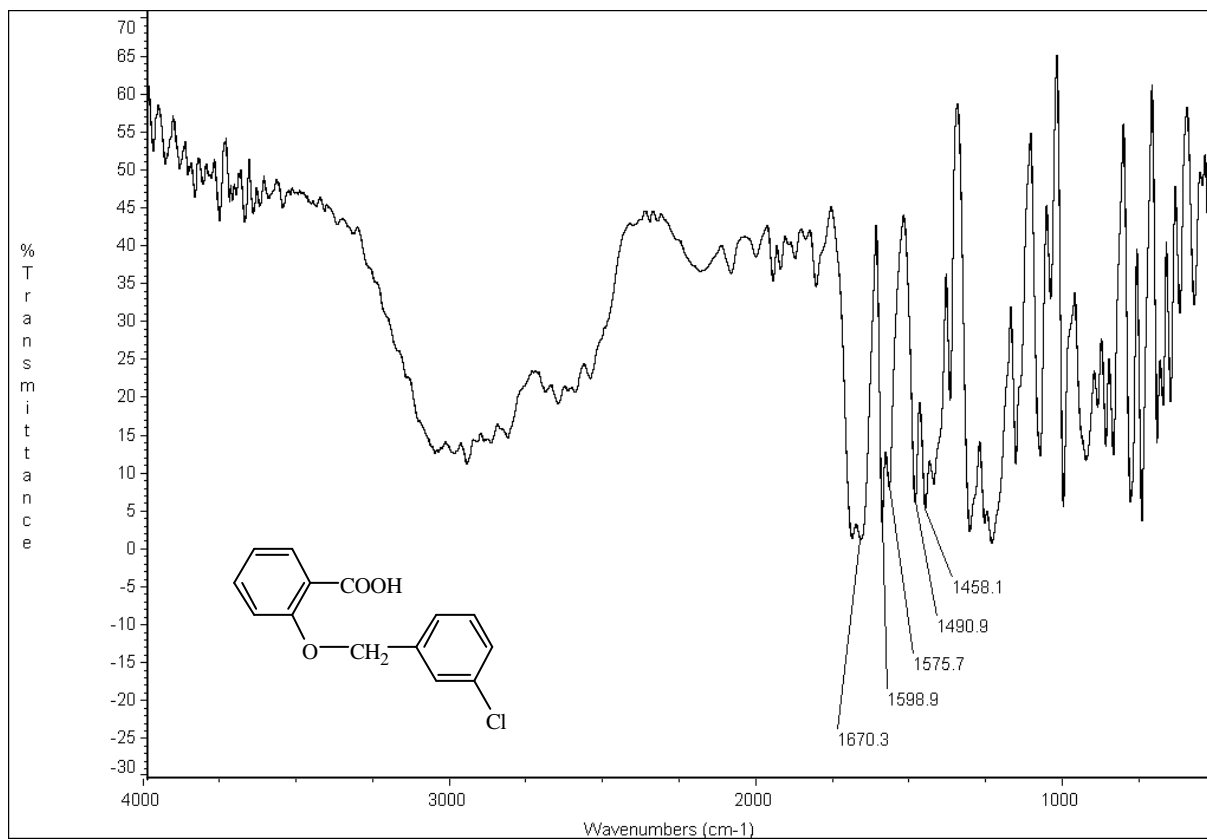


圖 58-2 IR (KBr) spectrum of compound **58**

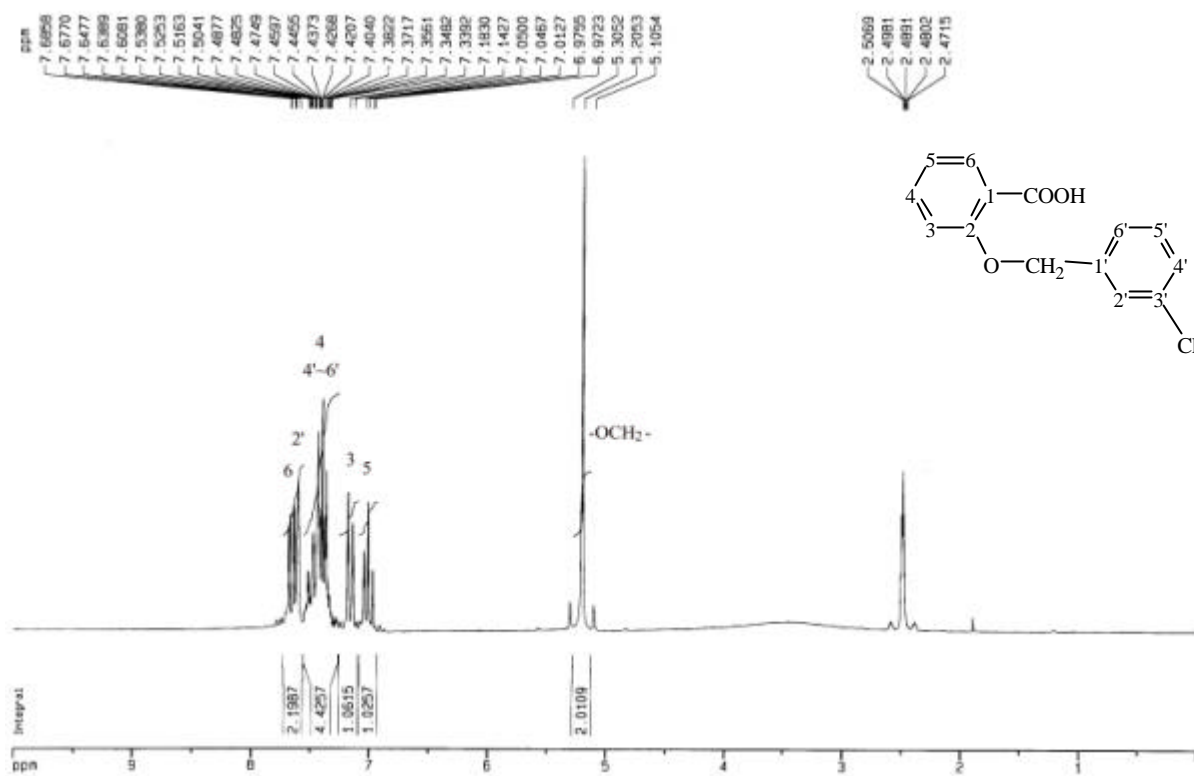


圖 58-3  $^1\text{H-NMR}$  ( $\text{DMSO-}d_6$ , 200 MHz) spectrum of compound **58**

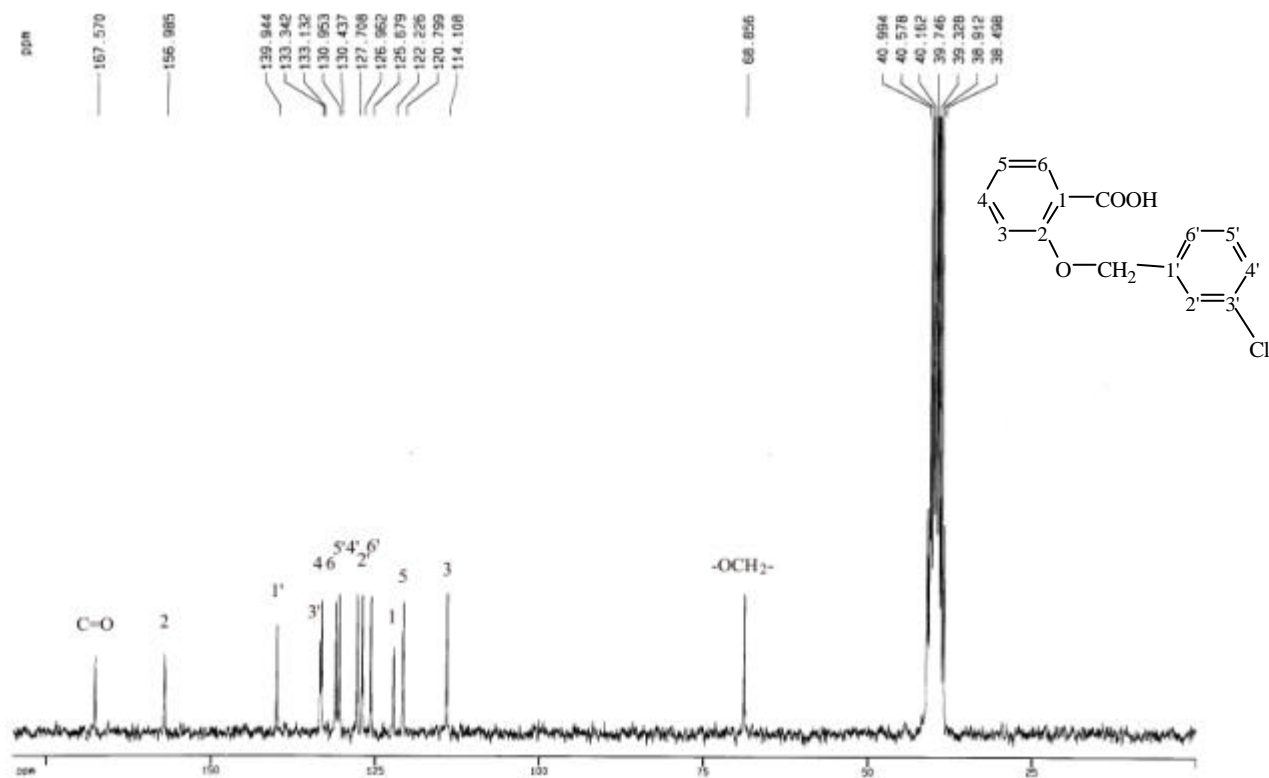


圖 58-4  $^{13}\text{C-NMR}$  ( $\text{DMSO-}d_6$ , 50 MHz) spectrum of compound **58**



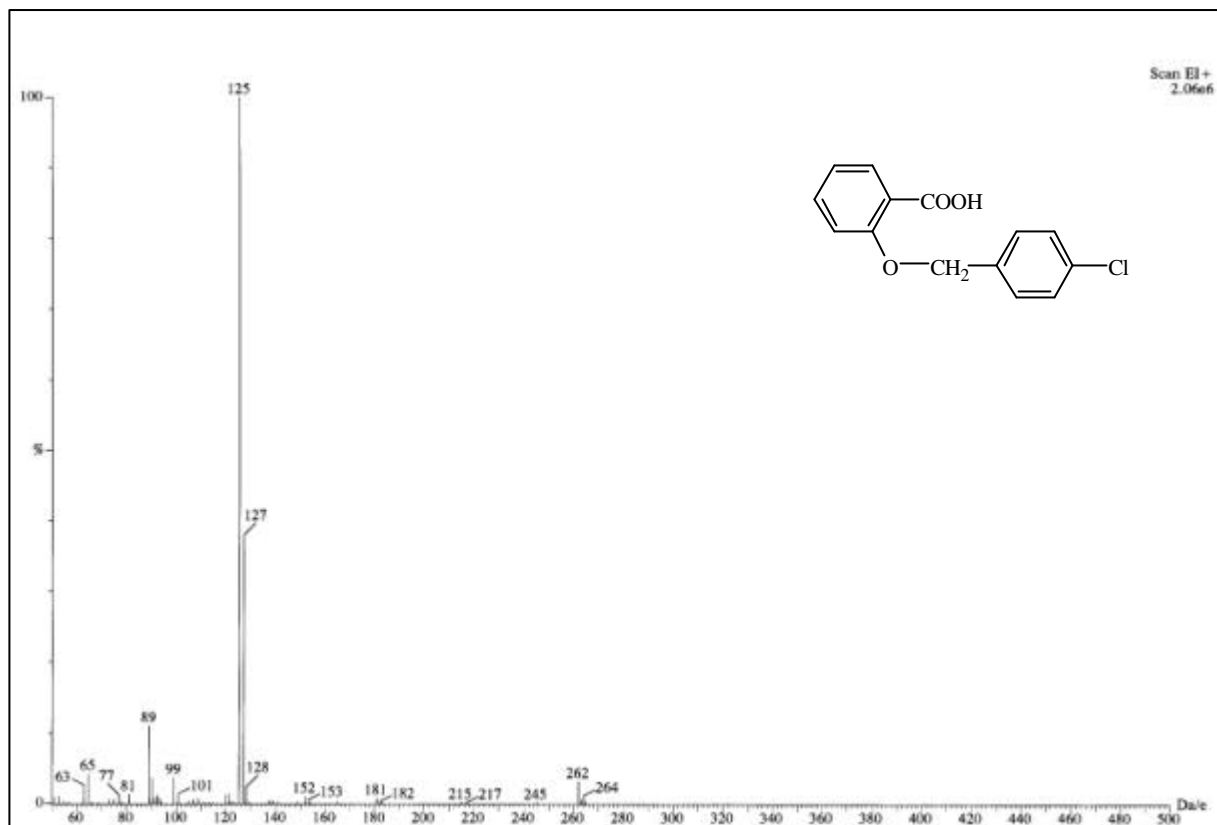


圖 59-1 MS spectrum of compound **59**

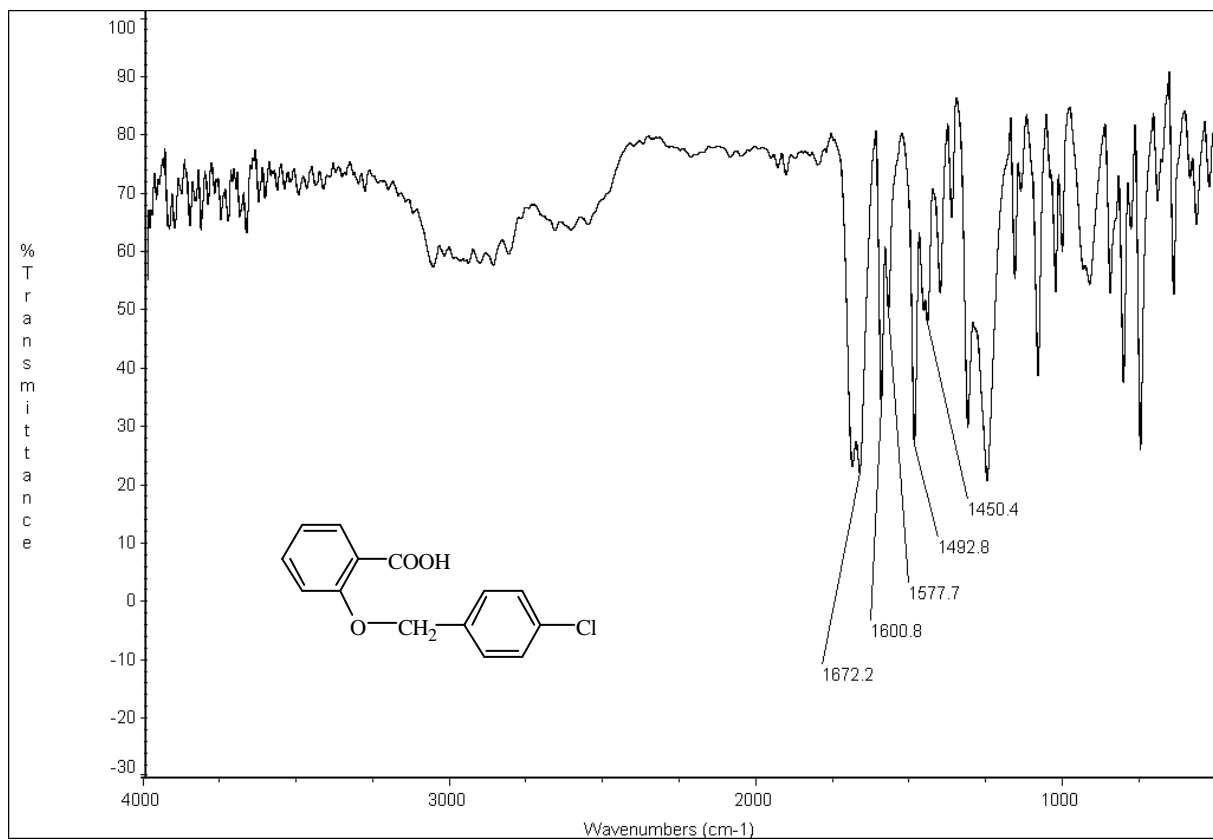


圖 59-2 IR (KBr) spectrum of compound **59**

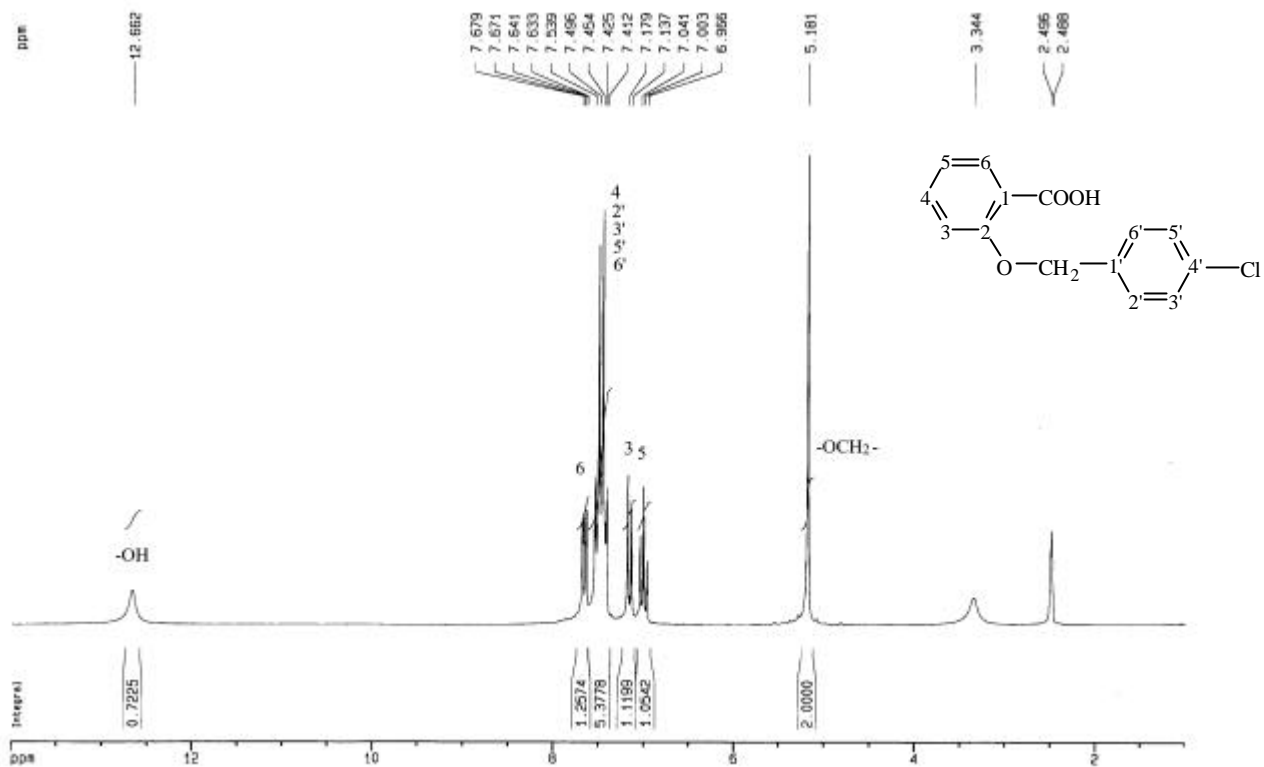


圖 59-3  $^1\text{H-NMR}$  ( $\text{DMSO-}d_6$ , 200 MHz) spectrum of compound **59**

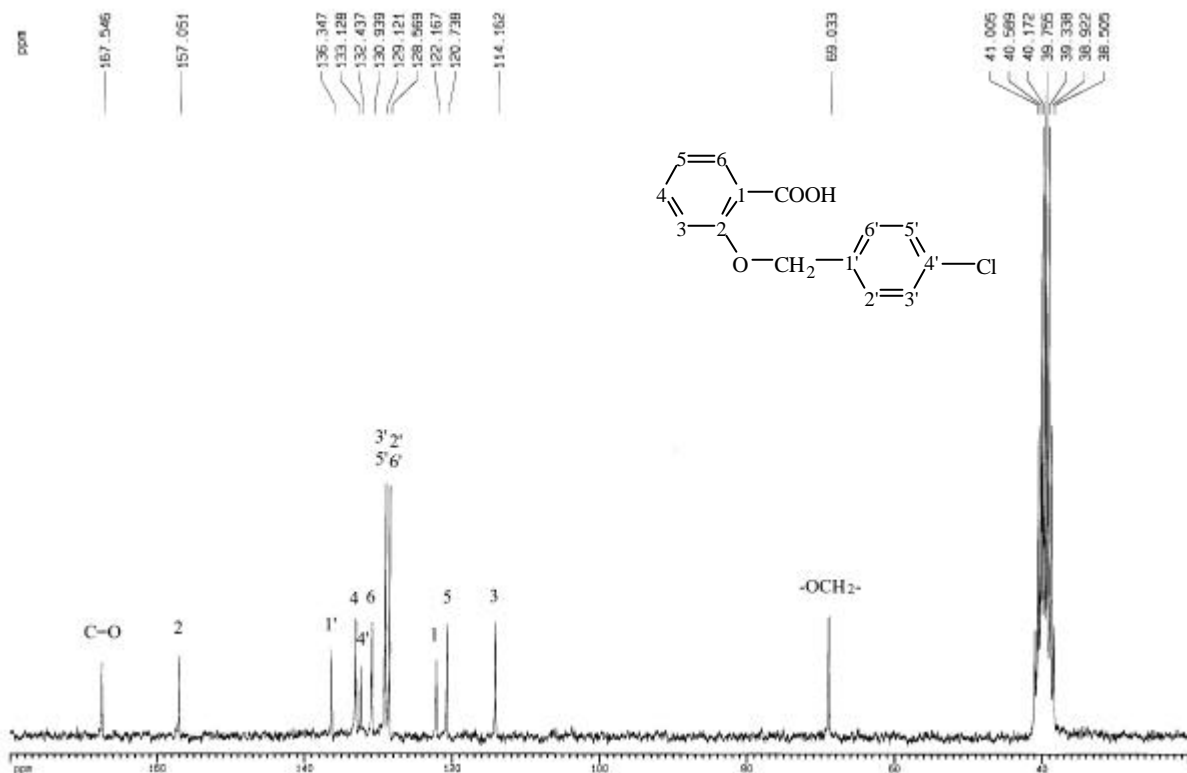


圖 59-4  $^{13}\text{C-NMR}$  ( $\text{DMSO-}d_6$ , 50 MHz) spectrum of compound **59**

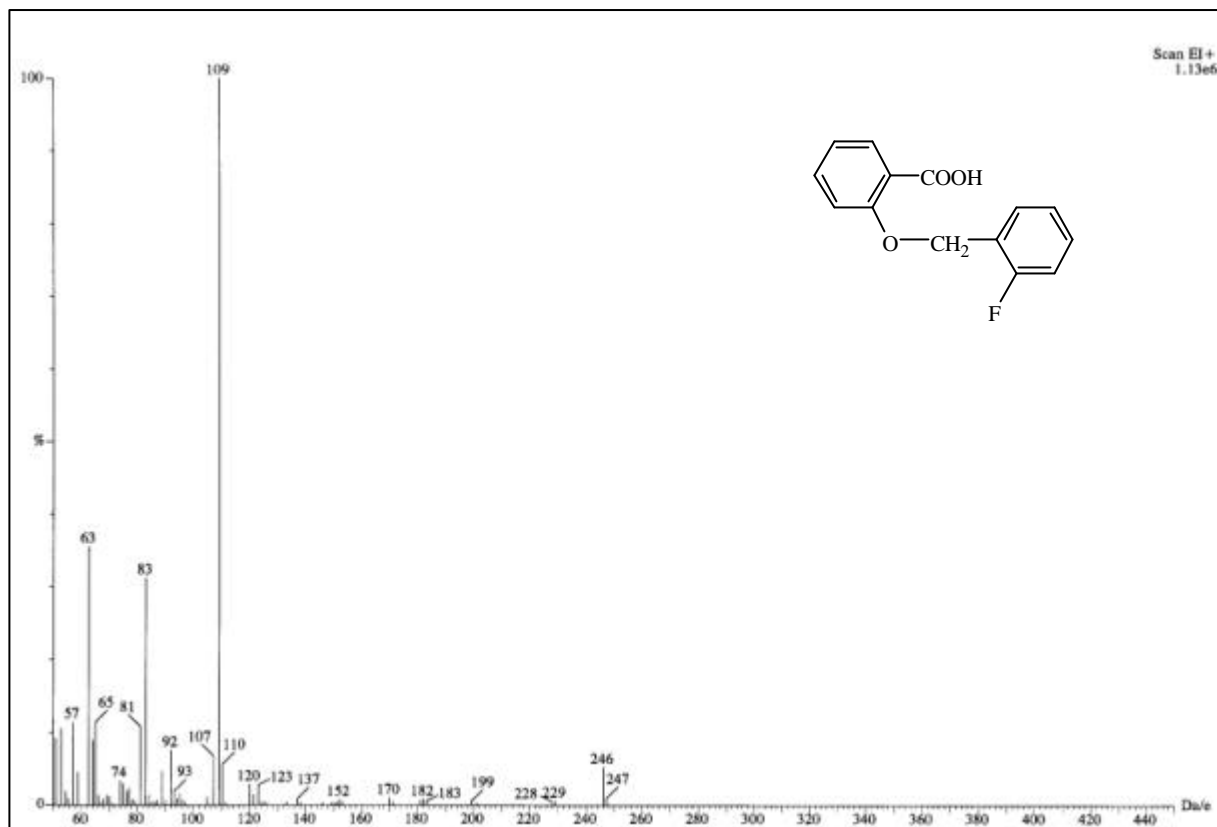


圖 60-1 MS spectrum of compound 60

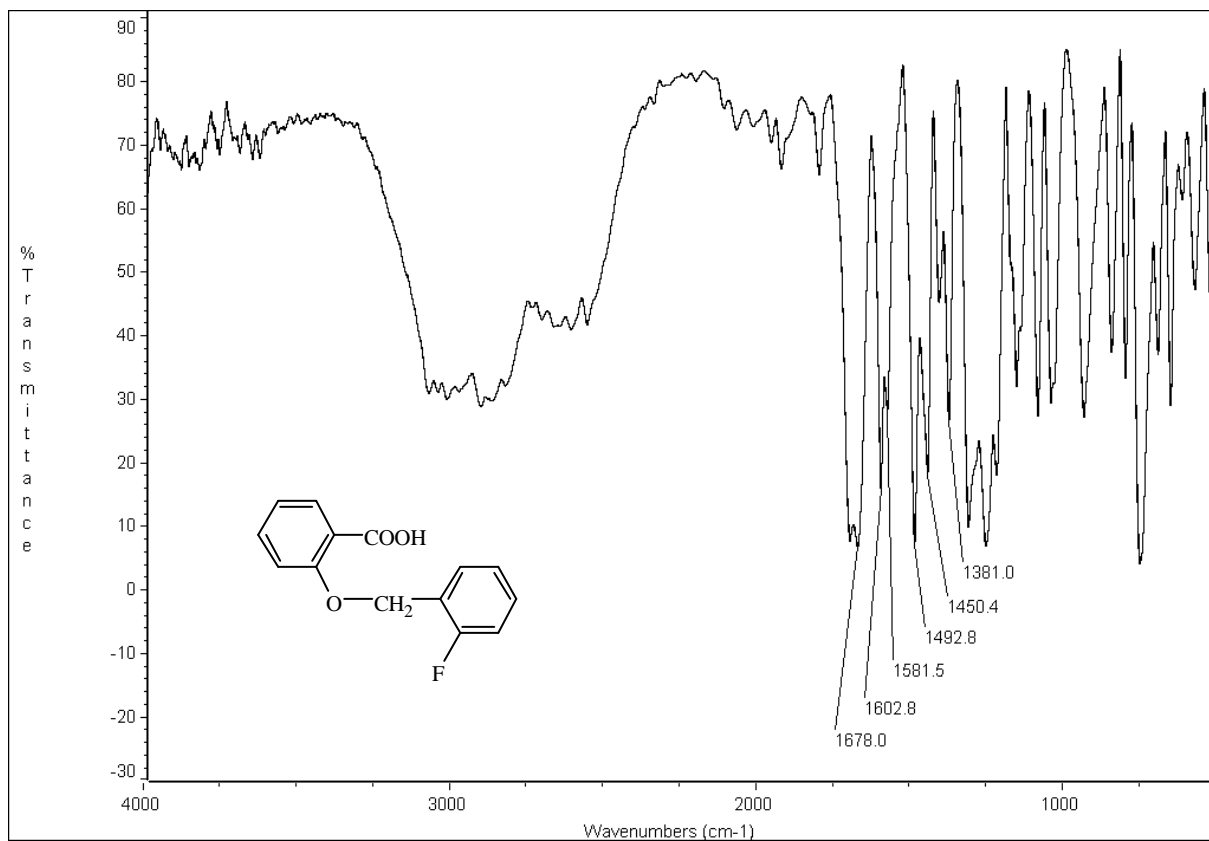


圖 60-2 IR (KBr) spectrum of compound 60

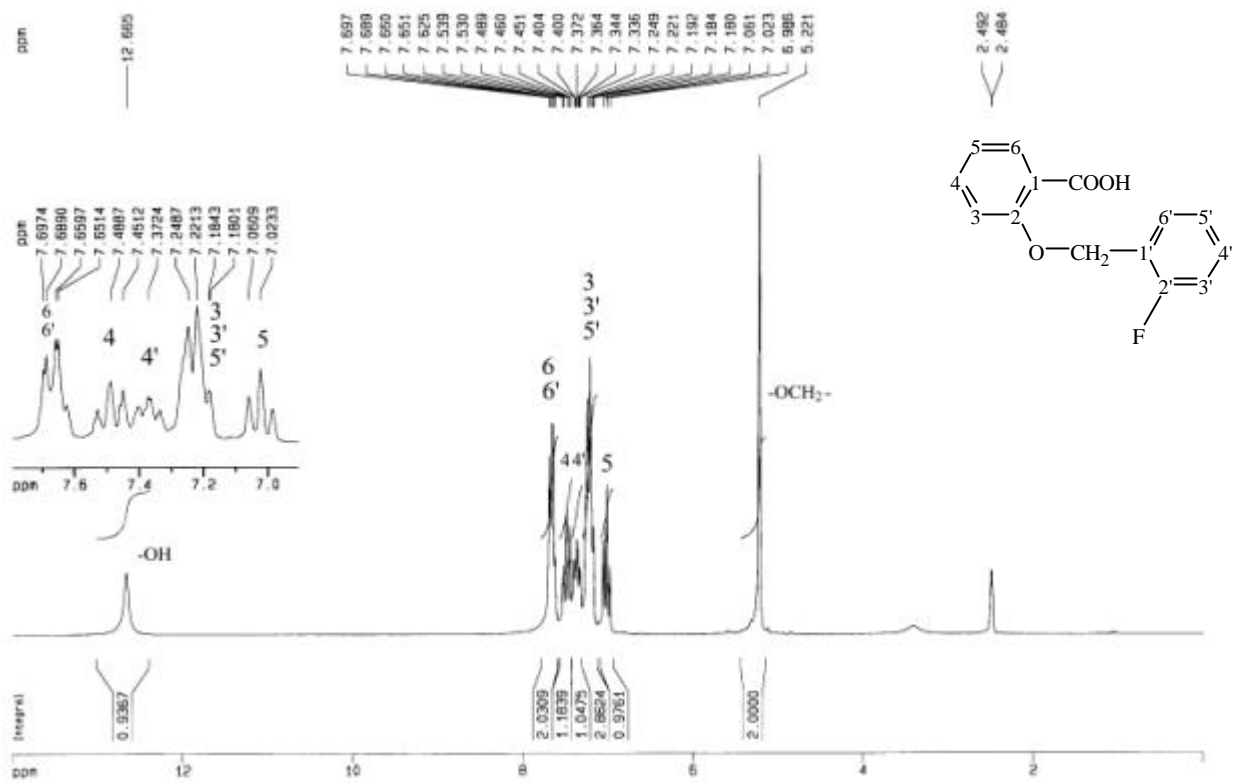


圖 60-3 <sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>, 200 MHz) spectrum of compound **60**

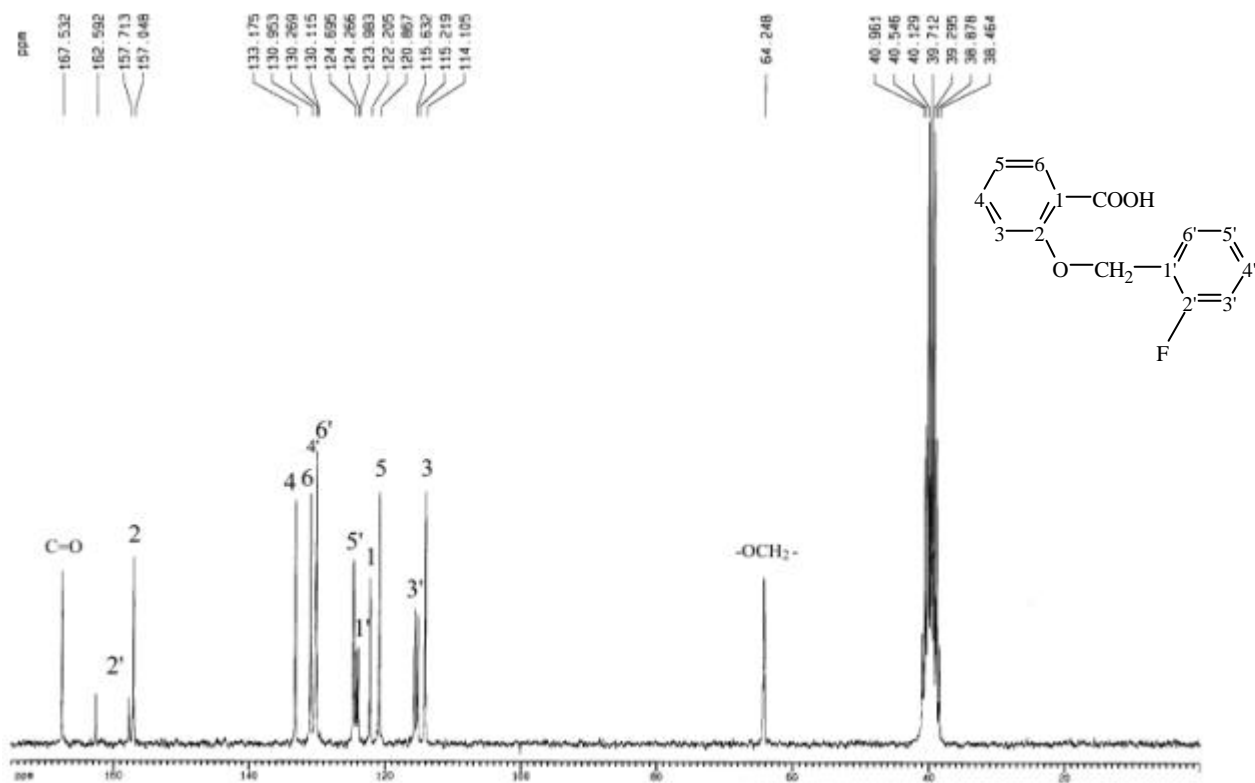


圖 60-4 <sup>13</sup>C-NMR (DMSO-*d*<sub>6</sub>, 50 MHz) spectrum of compound **60**