

## ONE-POT SYNTHESIS OF SUBSTITUTED BENZIMIDAZOLE DERIVATIVES UNDER ULTRASONIC IRRADIATION USING $\text{ZnFe}_2\text{O}_4$ REUSABLE CATALYST

Dhanraj Kamble<sup>ID a</sup>, Anil Shankarwar<sup>a</sup>, Yuvraj Sarnikar<sup>b</sup>, Radhakrushna Tigote<sup>c</sup>,  
Mubarak Shaikh<sup>ID d</sup>, Pravin Chavan<sup>ID e\*</sup>

<sup>a</sup>Department of Chemistry, Sarswati Bhuvan Education Society's, College of Science,  
Paithan gate Road, Gulmandi-03, Aurangabad 431001, Maharashtra, India

<sup>b</sup>Department of Chemistry, Dayanand Science College, Barshi Road, Prakash nagar, Latur 413531,  
Maharashtra, India

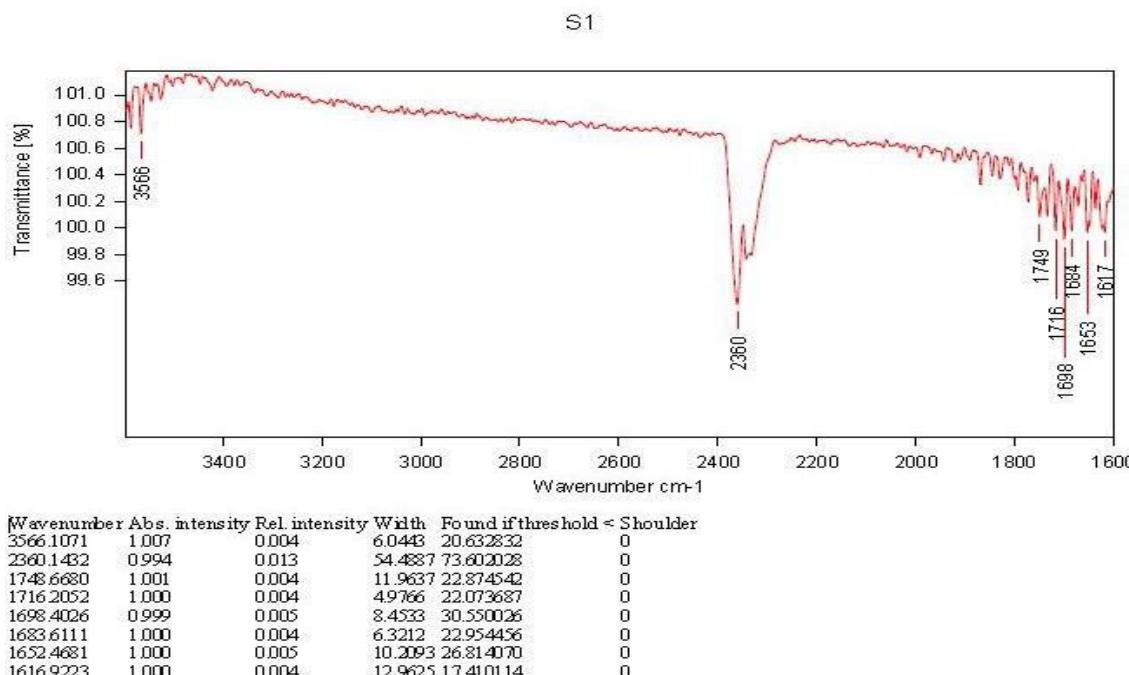
<sup>c</sup>Department of Chemistry, Dr. B. A. M. University (Aurangabad) Sub-campus, Near to MIDC-Sector-2,  
Osmanabad 413501, Maharashtra, India

<sup>d</sup>Department of Chemistry, Radhabai kale Mahila Mahavidyalaya, near to Tarakpur road Bus stand,  
Ahemednagar- 414001, Maharashtra, India

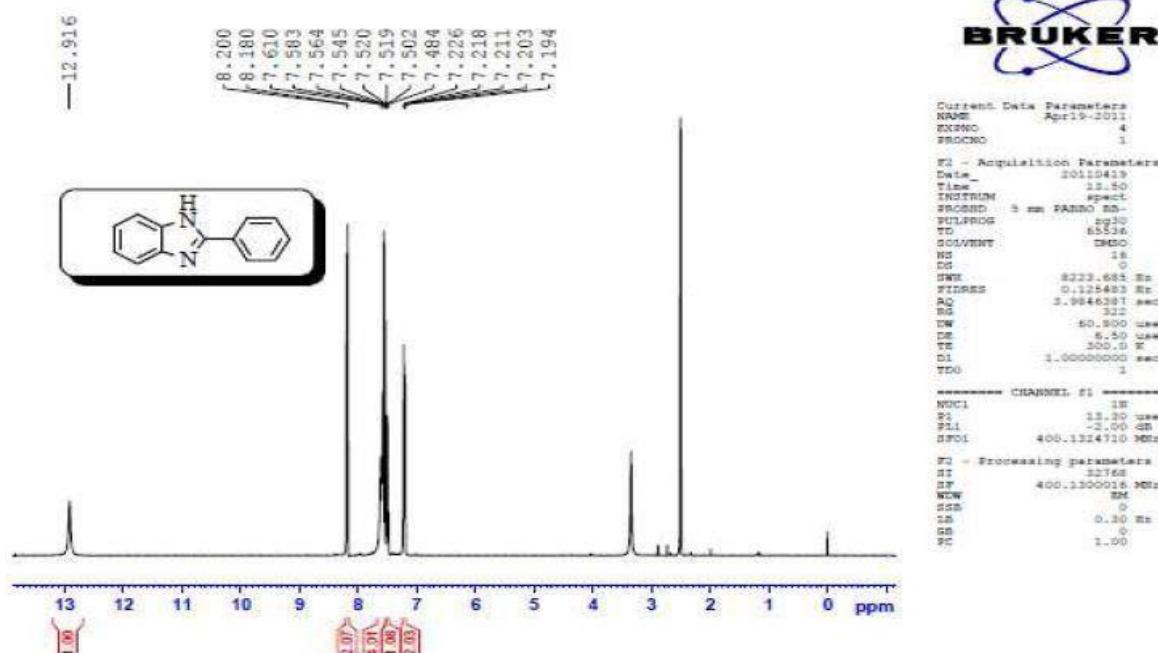
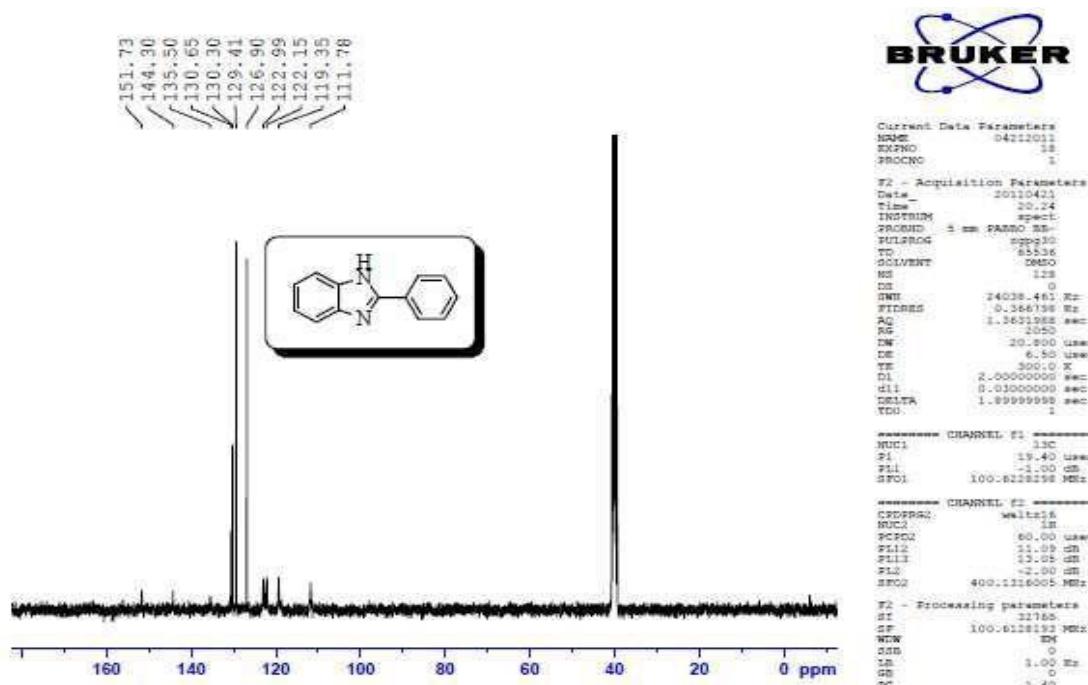
<sup>e</sup>Department of Chemistry, Doshi Vakil Arts College and G.C.U.B. Science & Commerce College,  
Goregaon, Lonere-Goregaon Road, Goregaon, Raigad 402103, Maharashtra, India.

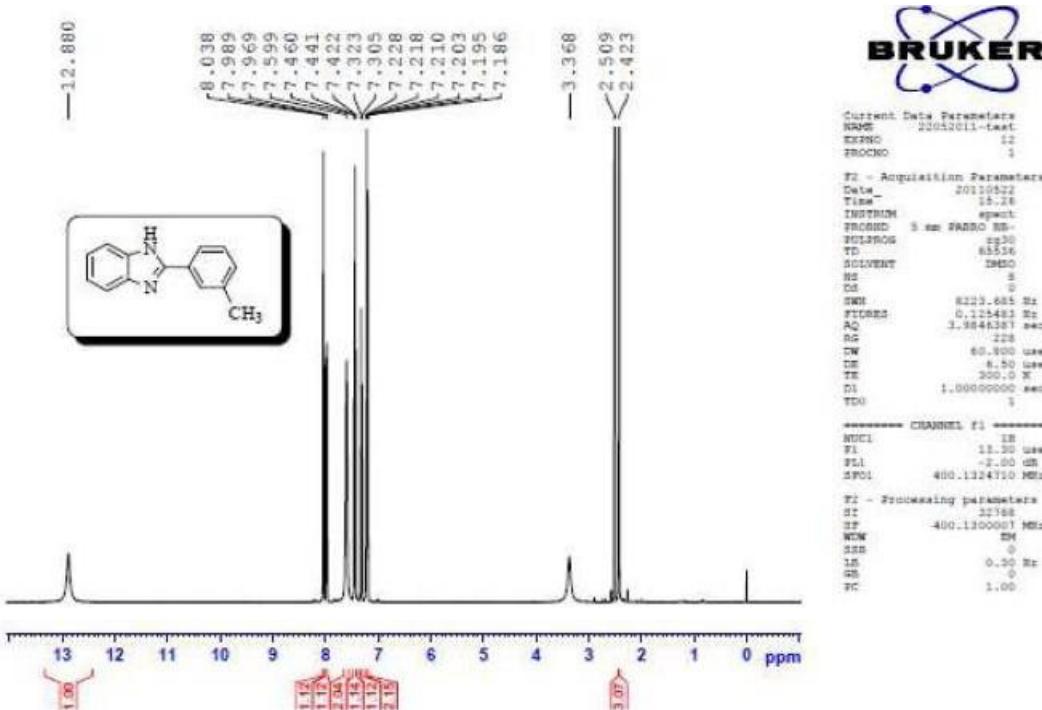
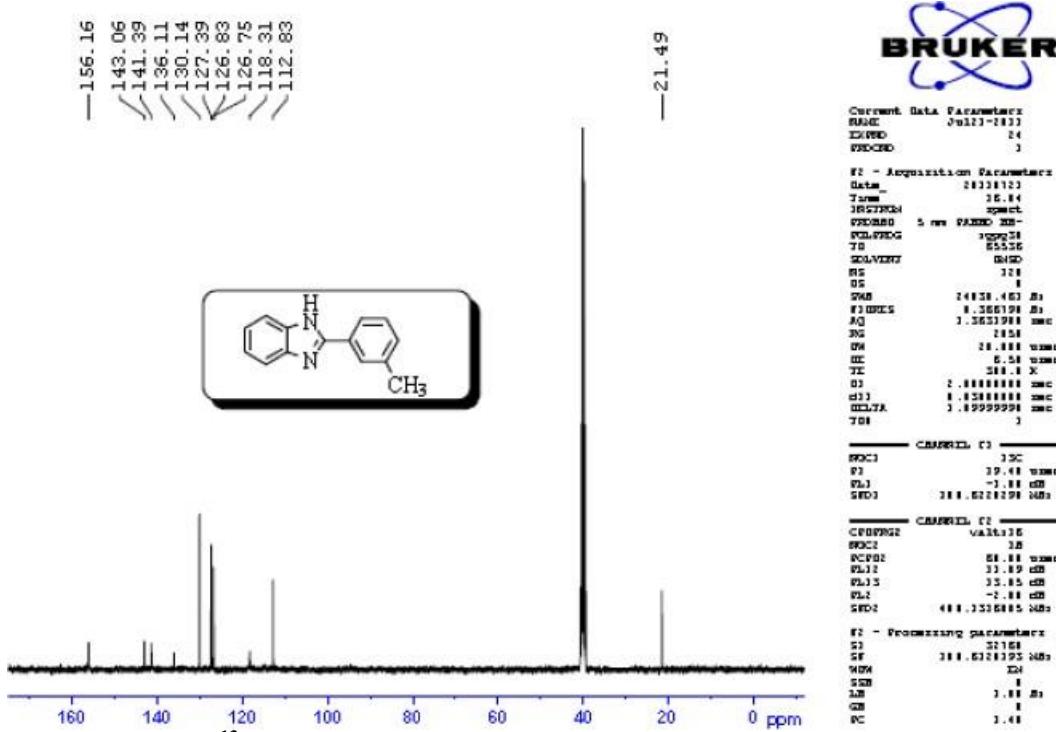
\*e-mail: chemistryp141286@gmail.com; phone: (+91 90)28 137 355

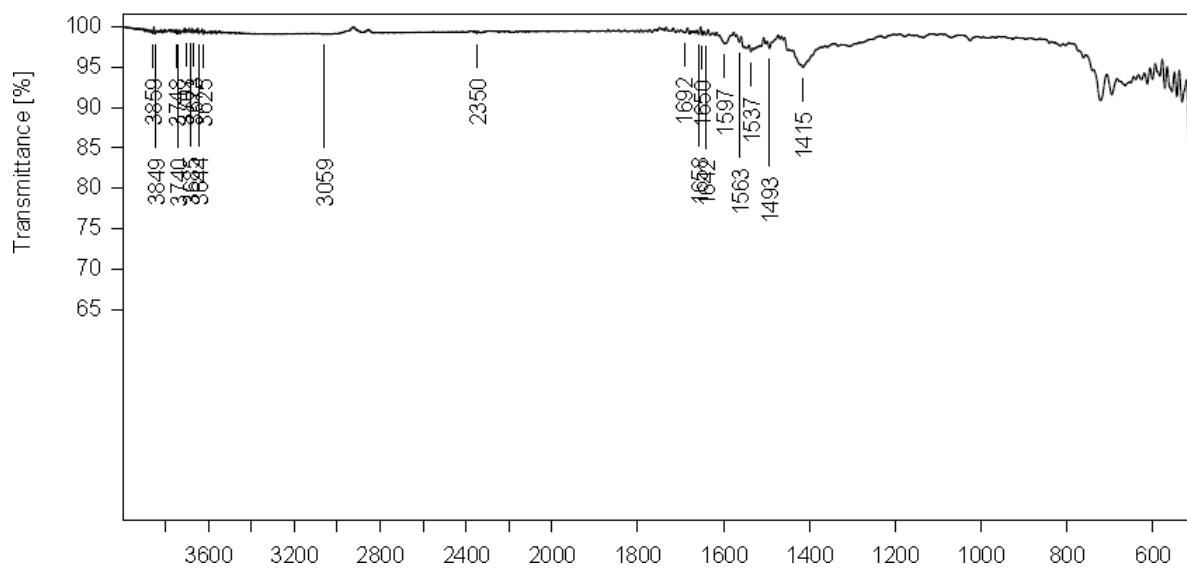
Received: 01 August 2022/ Revised final: 10 October 2022/Accepted: 13 October 2022



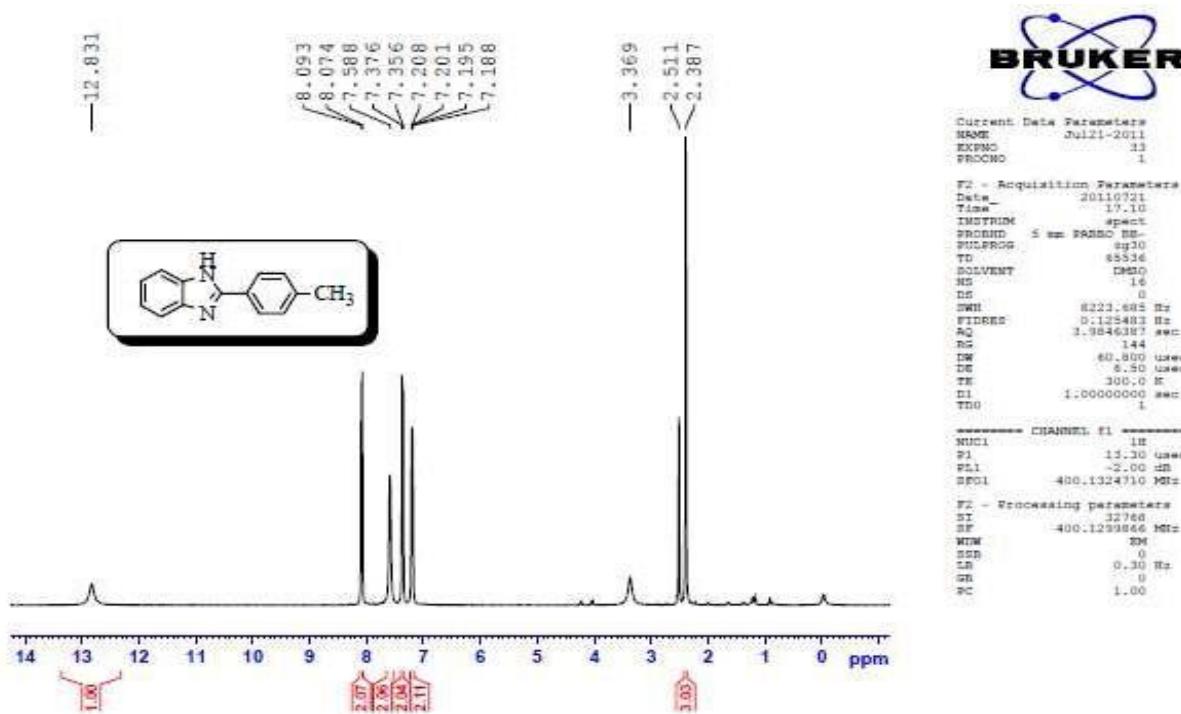
**Figure S1.** IR spectrum of 2-phenyl-1H-benzimidazole.

Figure S2.  $^1\text{H}$  NMR spectrum of 2-phenyl-1*H*-benzimidazole.Figure S3.  $^{13}\text{C}$  NMR spectrum of 2-phenyl-1*H*-benzimidazole.

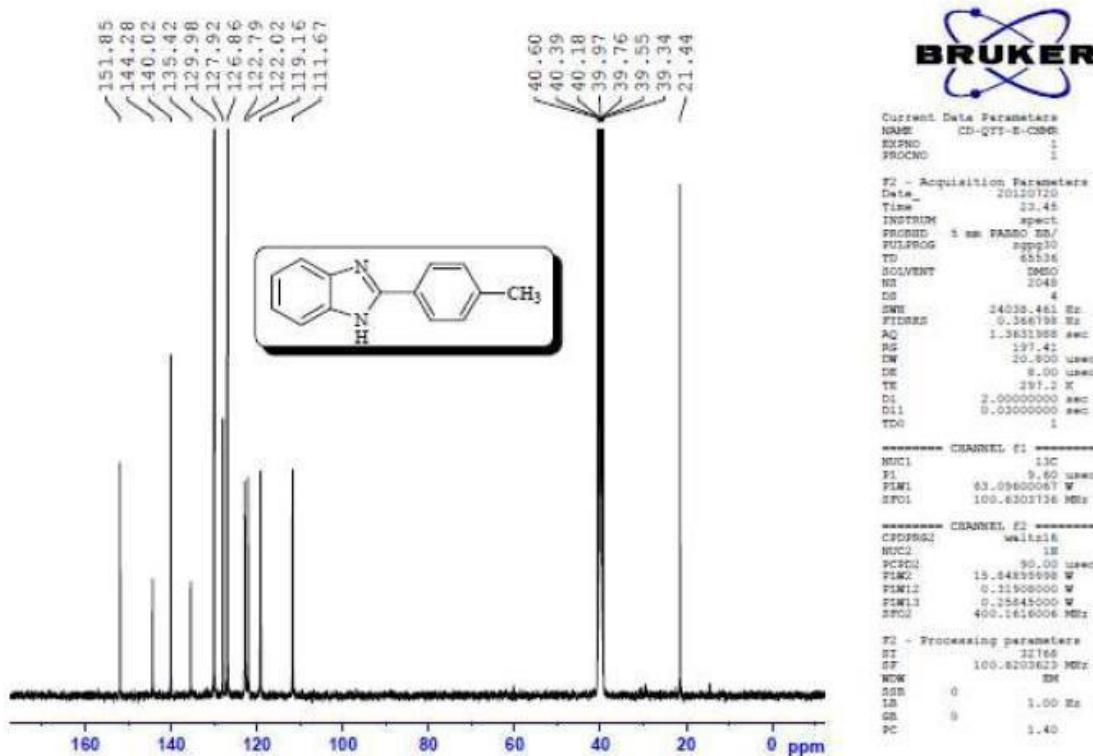
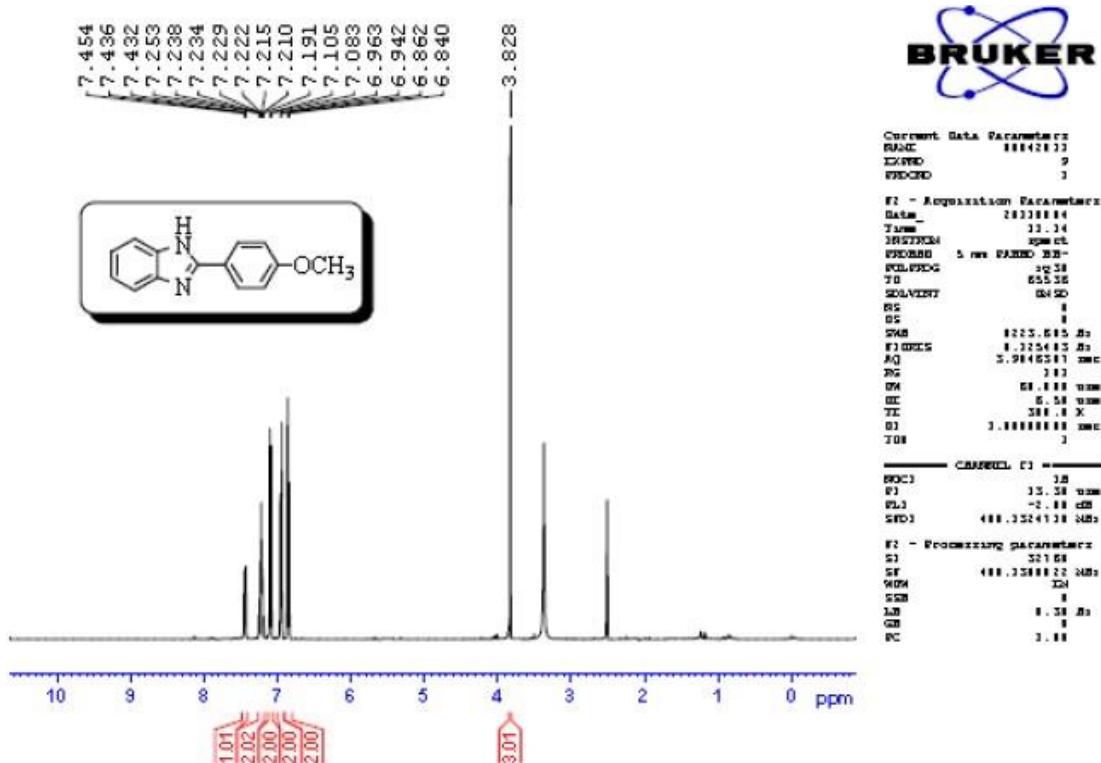
Figure S4.  $^1\text{H}$  NMR spectrum of 2-(3-methylphenyl)-1*H*-benzimidazole.Figure S5.  $^{13}\text{C}$  NMR spectrum of 2-(3-methylphenyl)-1*H*-benzimidazole.



**Figure S6.** IR spectrum of 2-(4-methylphenyl)-1*H*-benzimidazole.



**Figure S7.**  $^1\text{H}$  NMR spectrum of 2-(4-methylphenyl)-1*H*-benzimidazole.

Figure S8.  $^{13}\text{C}$  NMR spectrum of 2-(4-methylphenyl)-1*H*-benzimidazole.Figure S9.  $^1\text{H}$  NMR spectrum of 2-(4-methoxyphenyl)-1*H*-benzimidazole.

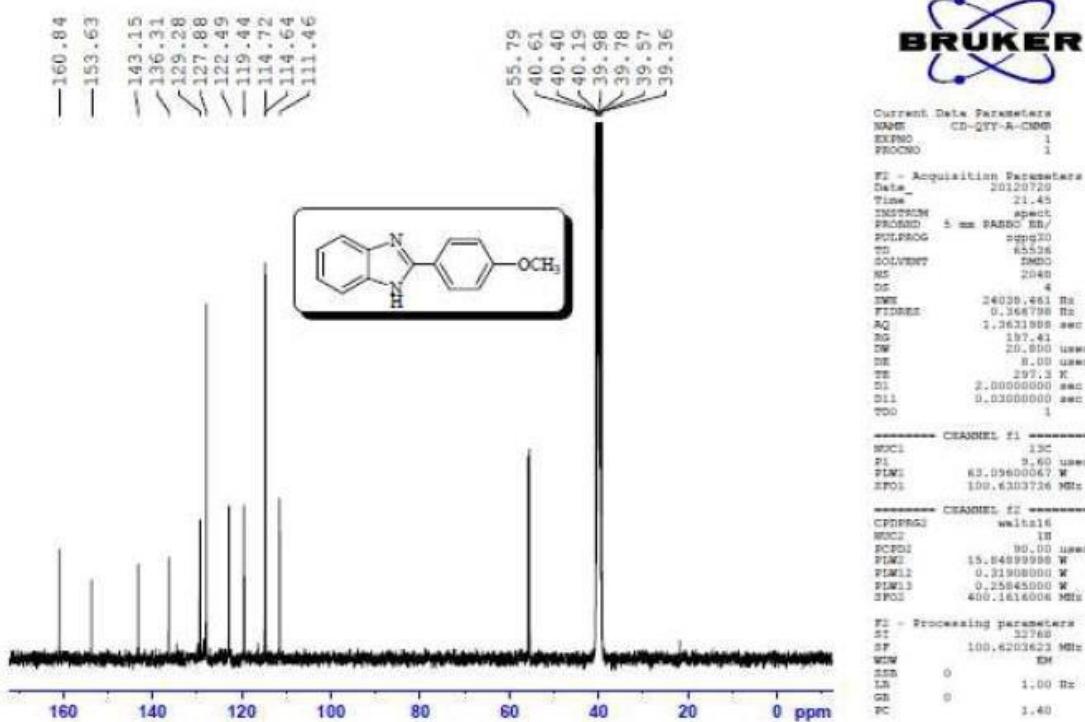


Figure S10.  $^{13}\text{C}$  NMR spectrum of 2-(4-methoxyphenyl)-1*H*-benzimidazole.

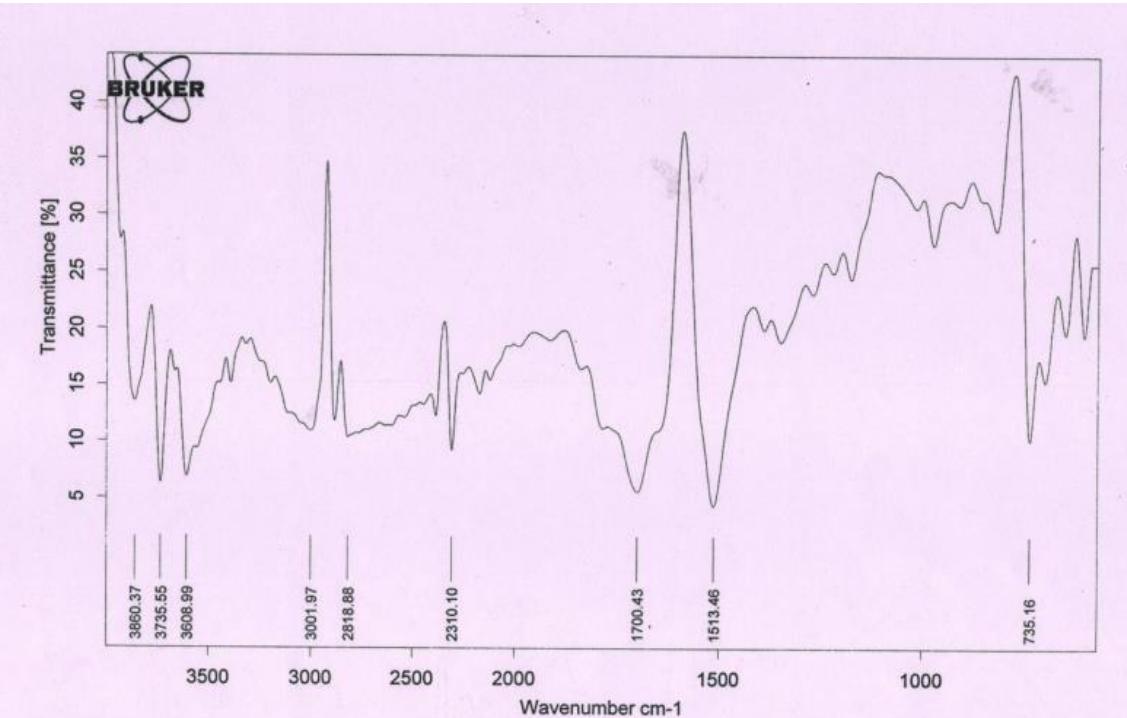
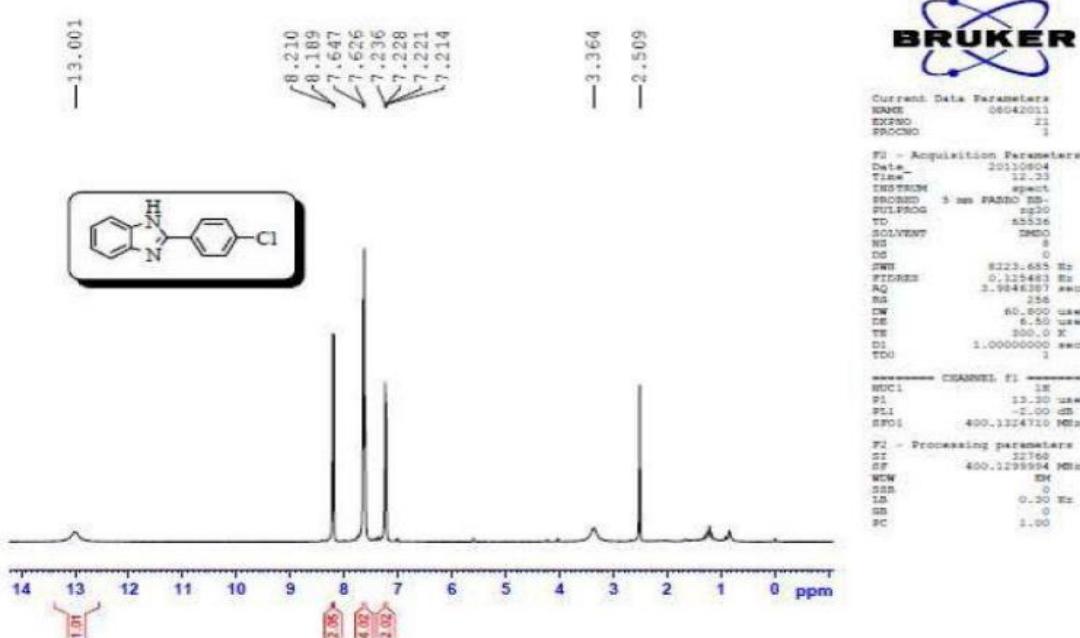
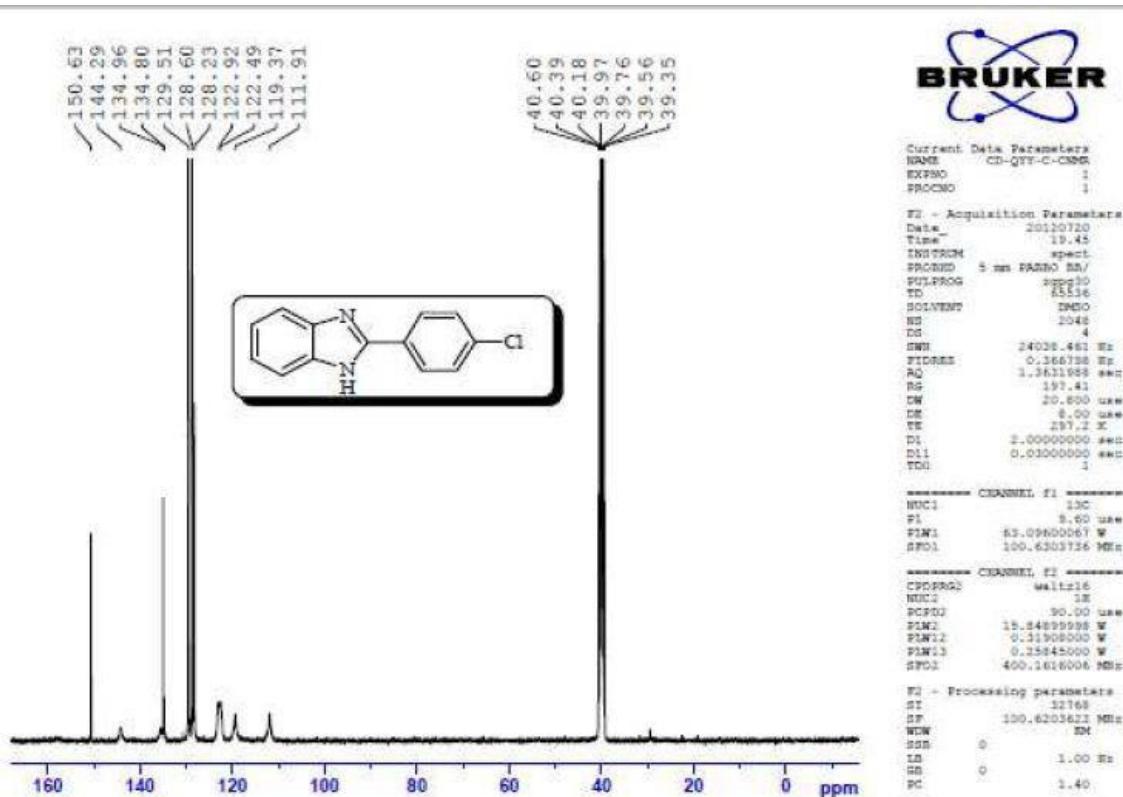


Figure S11. IR spectrum of 2-(4-chlorophenyl)-1*H*-benzimidazole.

Figure S12.  $^1\text{H}$  NMR spectrum of 2-(4-chlorophenyl)-1*H*-benzimidazole.Figure S13.  $^{13}\text{C}$  NMR spectrum of 2-(4-chlorophenyl)-1*H*-benzimidazole.

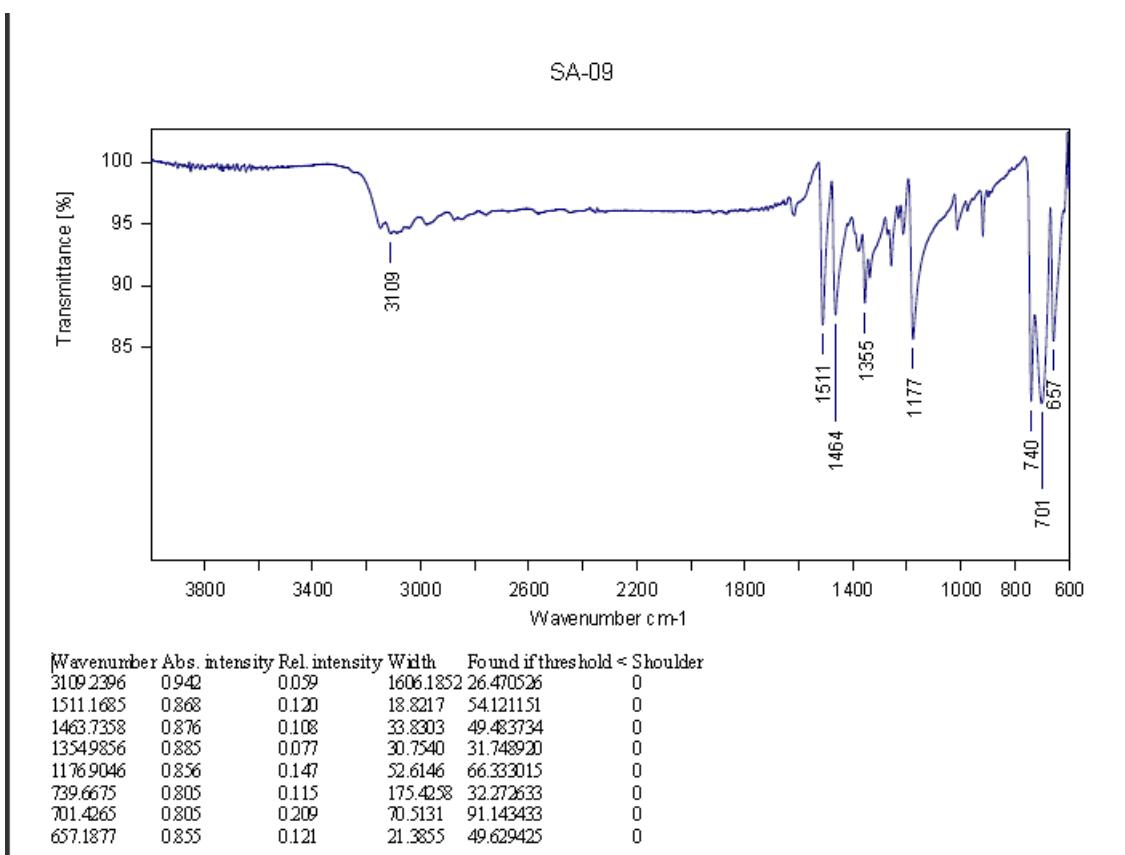
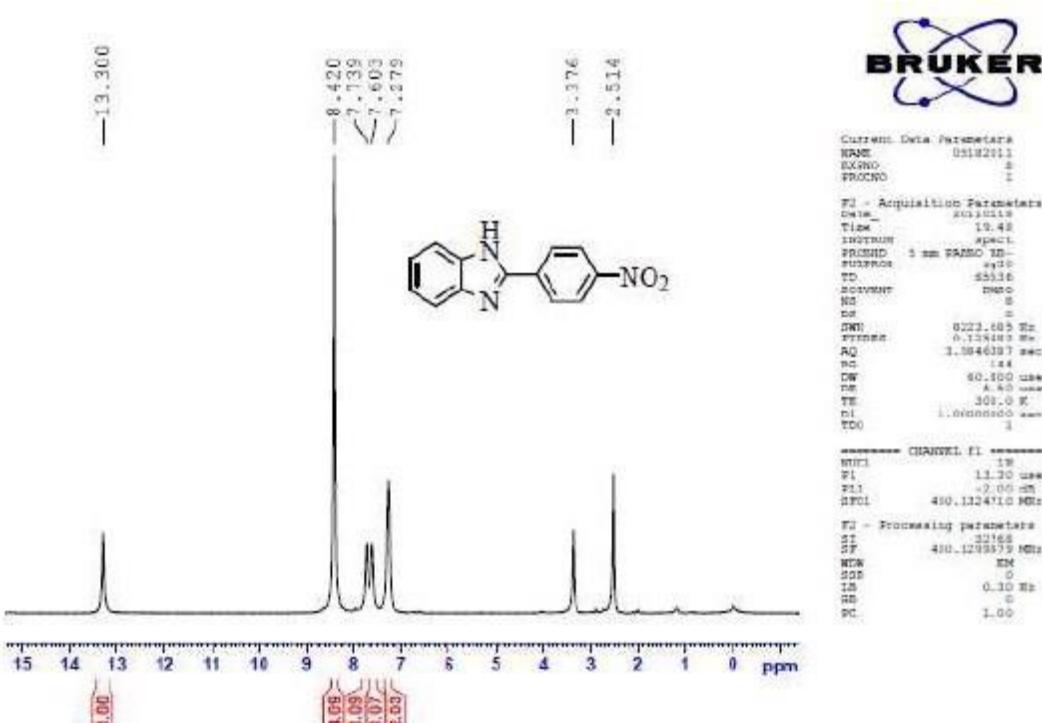
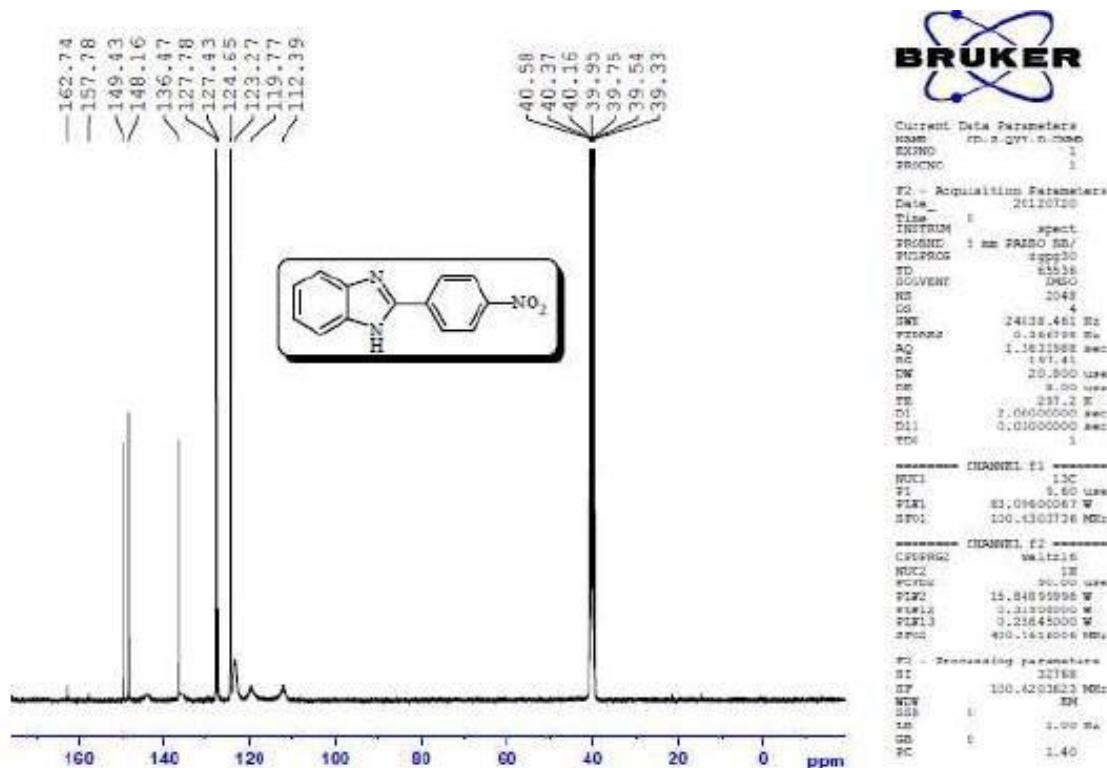
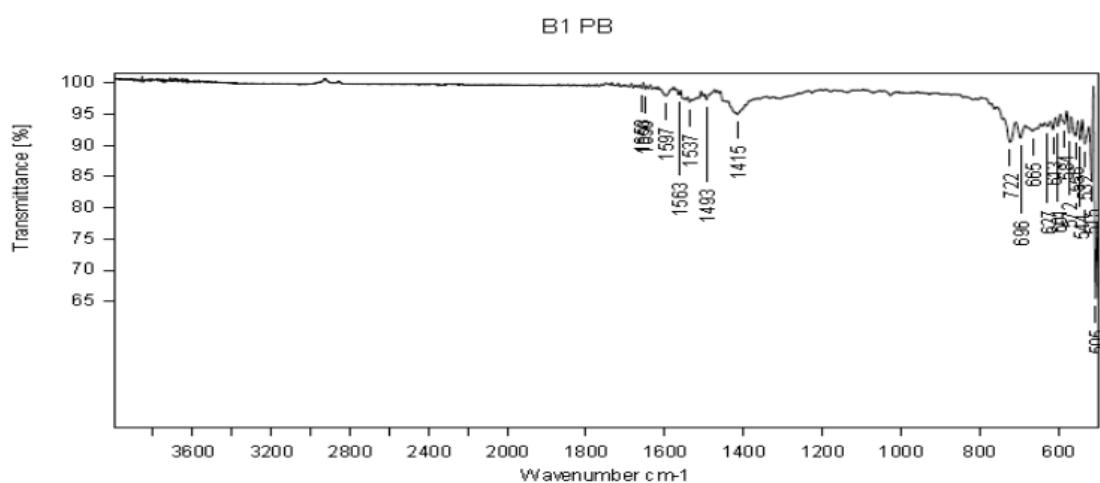


Figure S14. IR spectrum of 2-(4-nitrophenyl)-1H-benzimidazole.

Figure S15. <sup>1</sup>H NMR spectrum of 2-(4-nitrophenyl)-1H-benzimidazole.

Figure S16.  $^{13}\text{C}$  NMR spectrum of 2-(4-nitrophenyl)-1*H*-benzimidazole.Figure S17. IR spectrum of 6-methyl-2-phenyl-1*H*-benzimidazole.

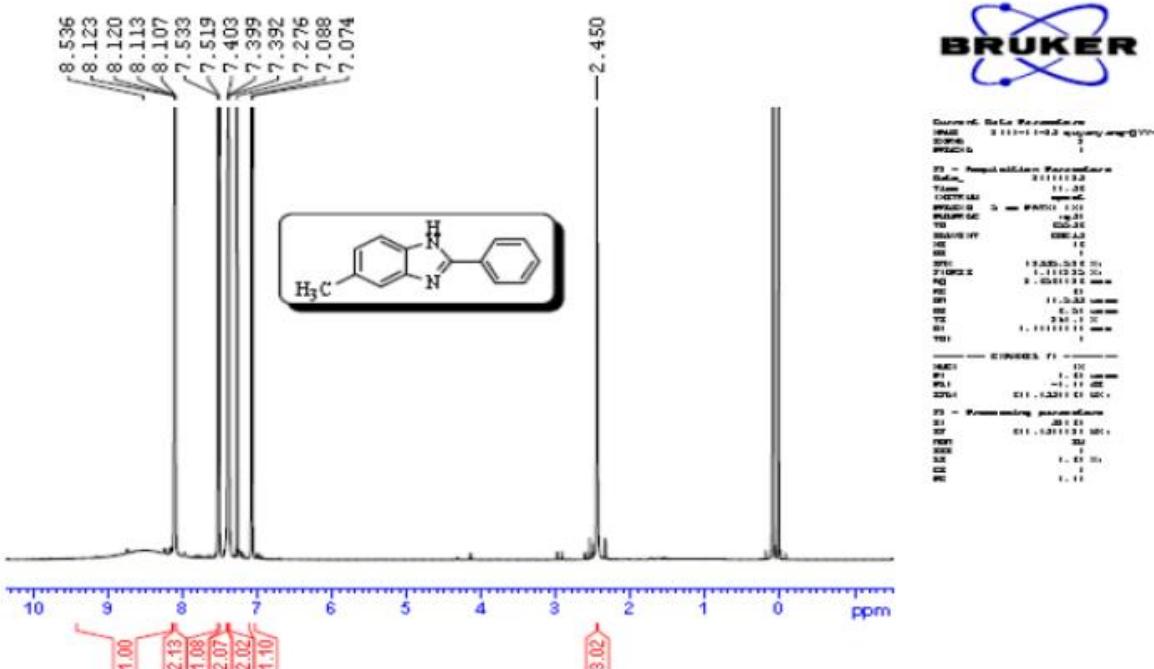


Figure S18.  $^1\text{H}$  NMR spectrum of 6-methyl-2-phenyl-1*H*-benzimidazole.

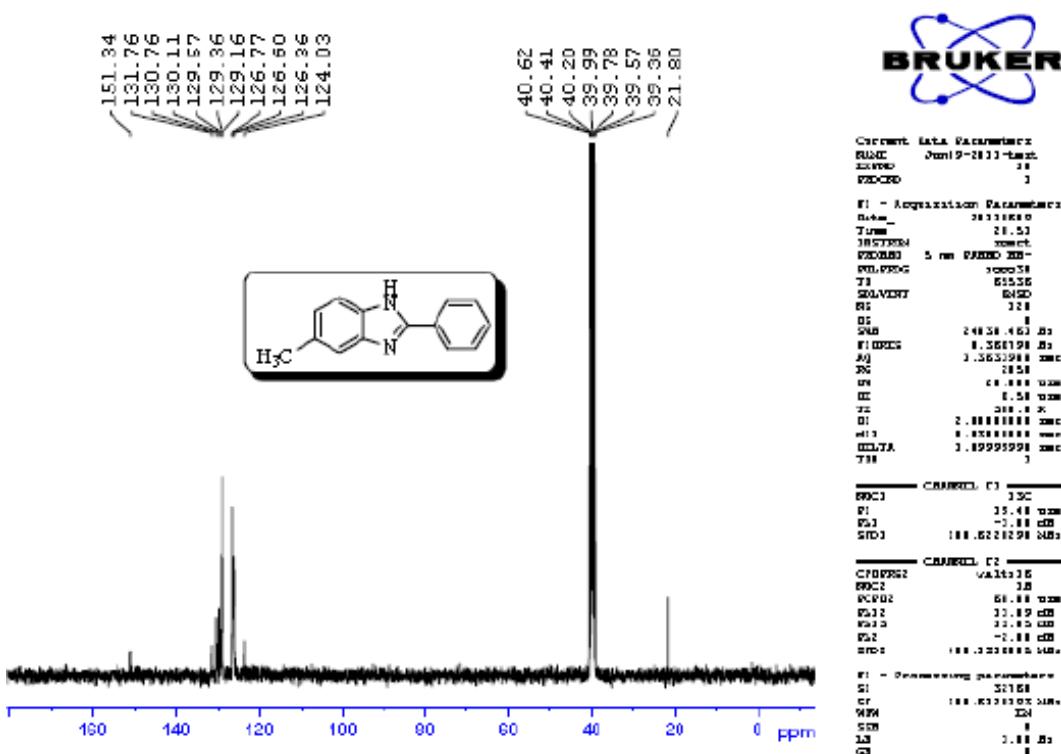
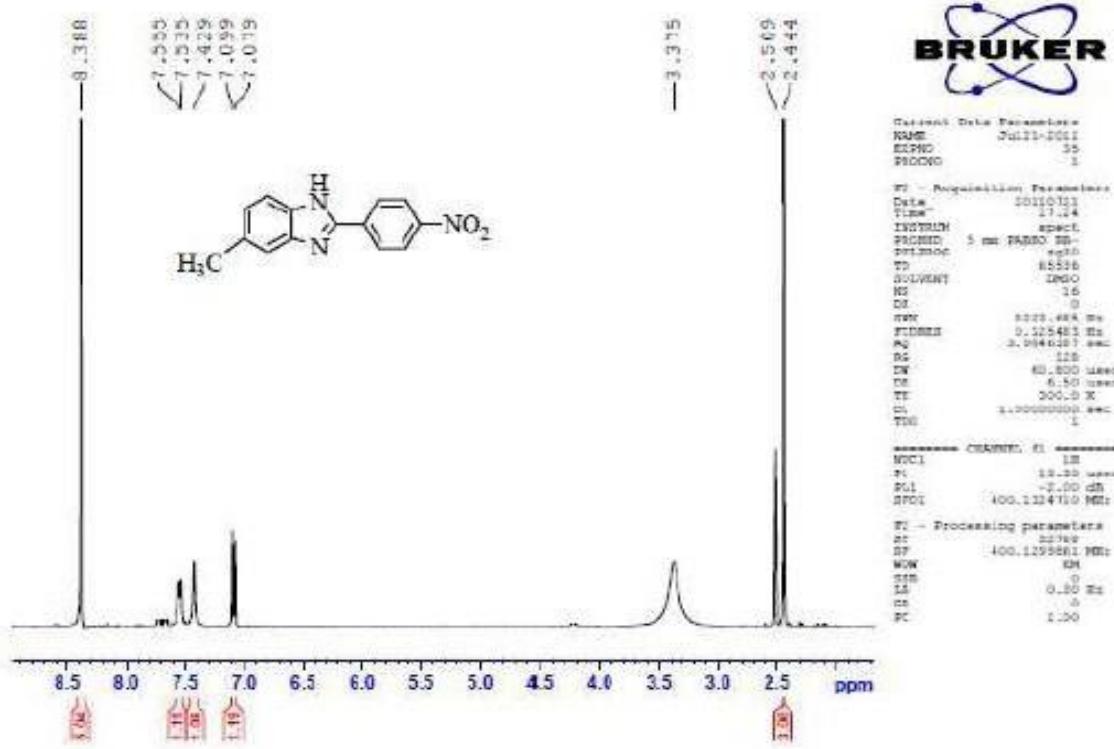
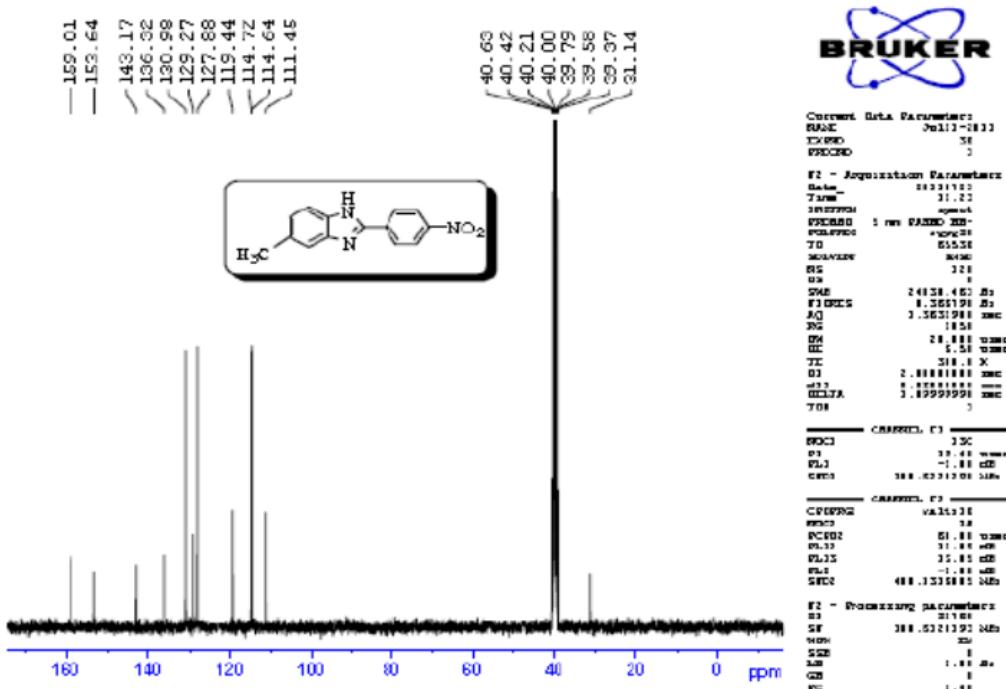


Figure S19.  $^{13}\text{C}$  NMR spectrum of 6-methyl-2-phenyl-1*H*-benzimidazole.

Figure S20.  $^1\text{H}$  NMR spectrum of 6-methyl-2-(4-nitrophenyl)-1*H*-benzimidazole.Figure S21.  $^{13}\text{C}$  NMR spectrum of 6-methyl-2-(4-nitrophenyl)-1*H*-benzimidazole.

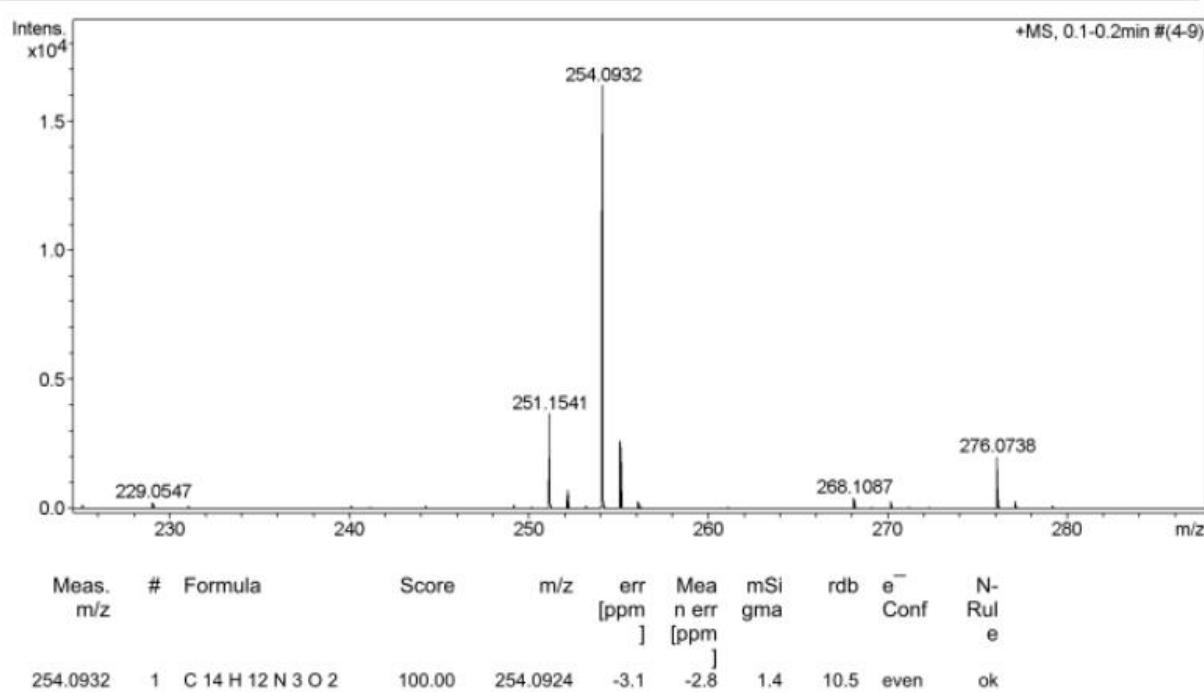


Figure S22. Mass spectrum of 6-methyl-2-(4-nitrophenyl)-1*H*-benzimidazole.

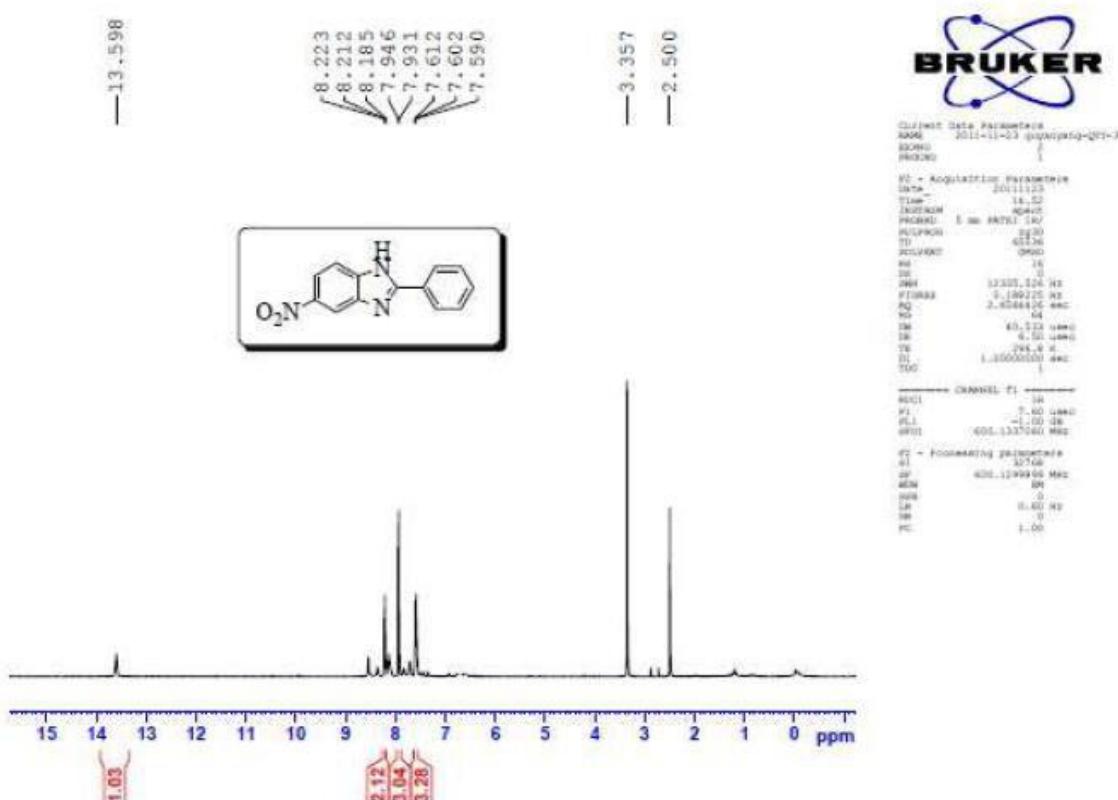
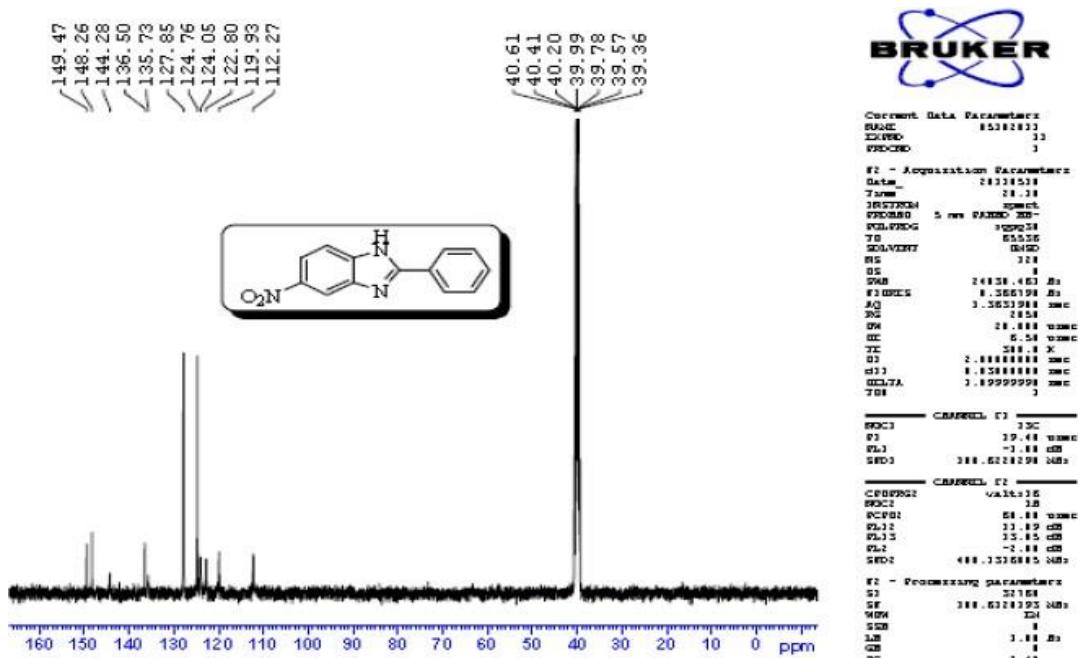
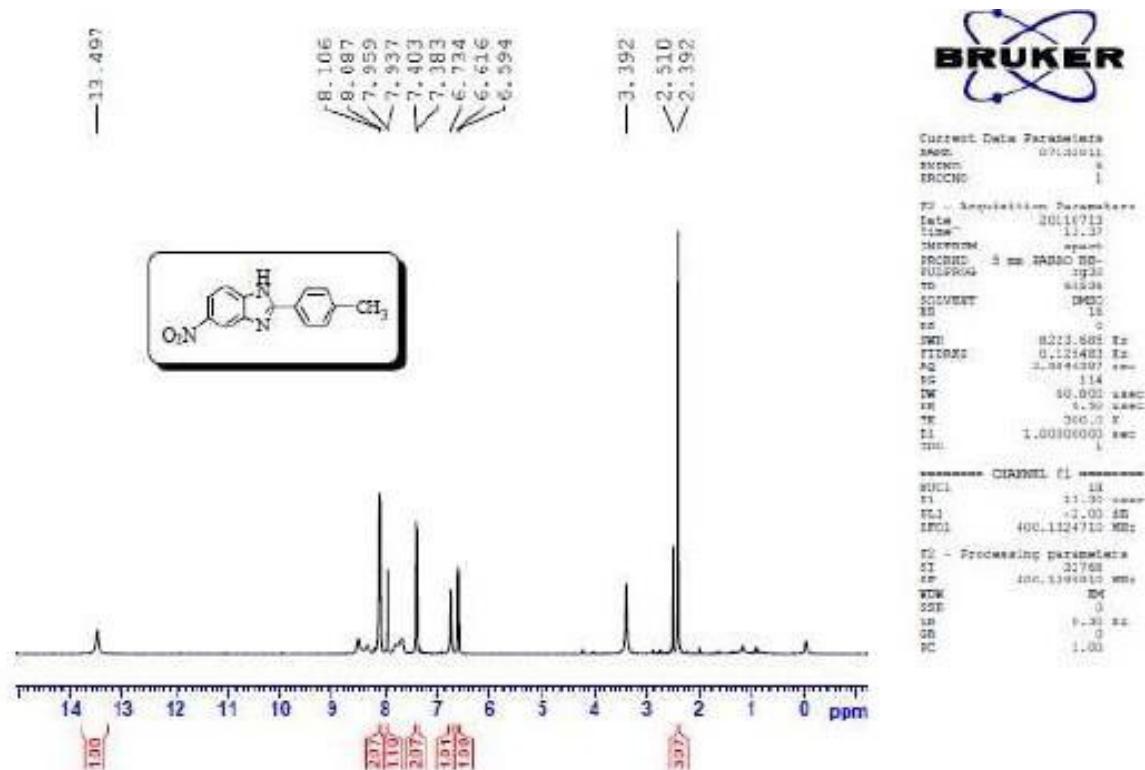


Figure S23. <sup>1</sup>H NMR spectrum of 6-nitro-2-phenyl-1*H*-benzimidazole.

Figure S24.  $^{13}\text{C}$  NMR spectrum of 6-nitro-2-phenyl-1*H*-benzimidazole.Figure S25.  $^1\text{H}$  NMR spectrum of 6-nitro-2-(4-methylphenyl)-1*H*-benzimidazole.

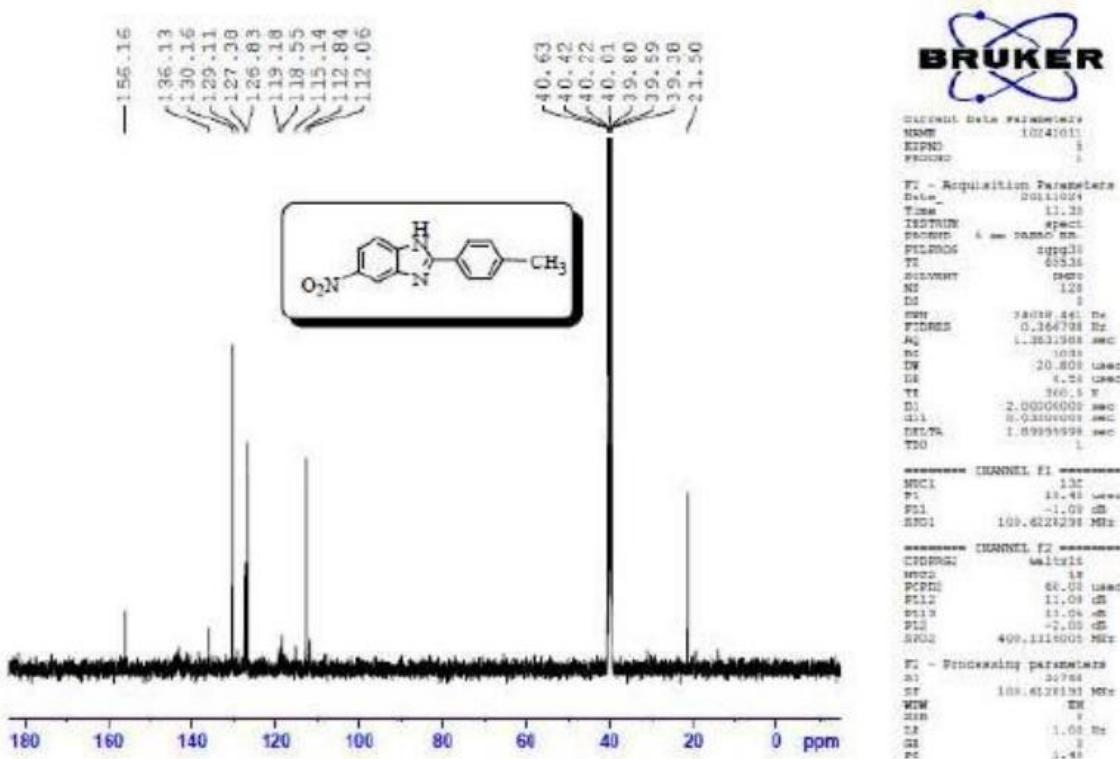


Figure S26.  $^{13}\text{C}$  NMR spectrum of 6-nitro-2-(4-methylphenyl)-1*H*-benzimidazole.