

Co(II)-Cu(II) Mixed Oxide Catalyst for Single Step Synthesis of 2,4,5-Triaryle-1H-Imidazole Derivatives Under Microwave Irradiation

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FTIR:

FTIR spectrum shown in figure 1, (Model FT/IR- 4600 in solid phase) from 400–4000 cm^{-1} for synthesized catalyst material. Characterization shows the absorption intensities at 3666, 3445, 1604 and 1399 cm^{-1} are due to chemisorbed water molecules. Frequency 2929, 2852, 2358 and 2315 cm^{-1} are due to asymmetric and symmetric stretching of catalyst material, 1017 cm^{-1} shows stretching vibration of Co=O and Cu=O. The band at 659 and 581 cm^{-1} are due to Co-O and Cu-O bending vibrations.

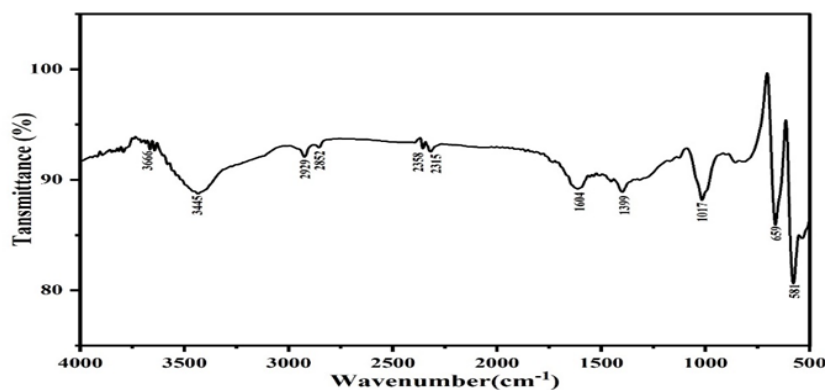


Figure: 1. FTIR spectra of Co-Cu oxide mixed composite.

TOF-MS Spectra:

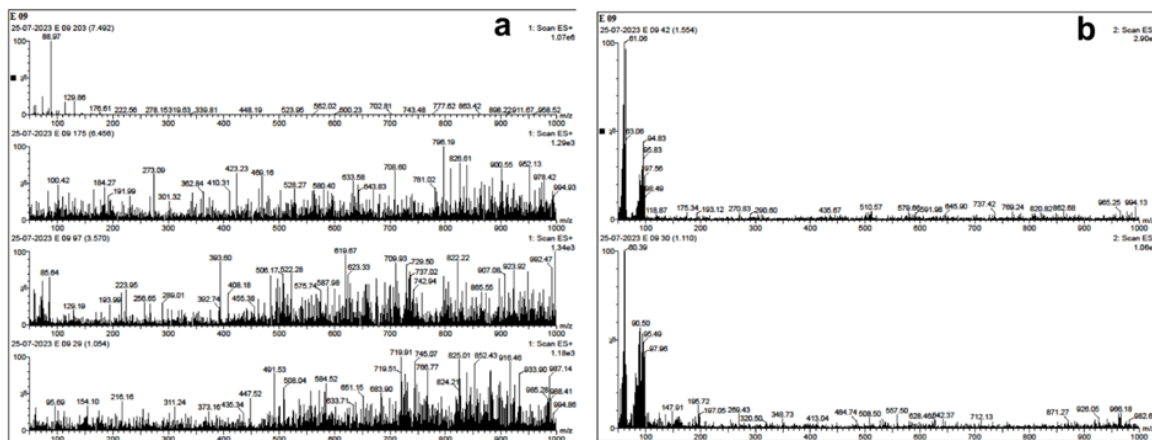


Figure 2. TOF MS ES spectra of Co-Cu oxide mixed phase a) TOF MS ES+ b) TOF MS ES-

Catalyst preparation:

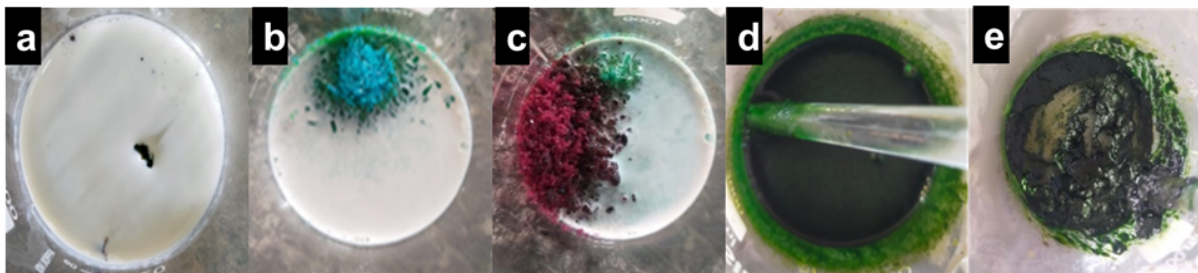
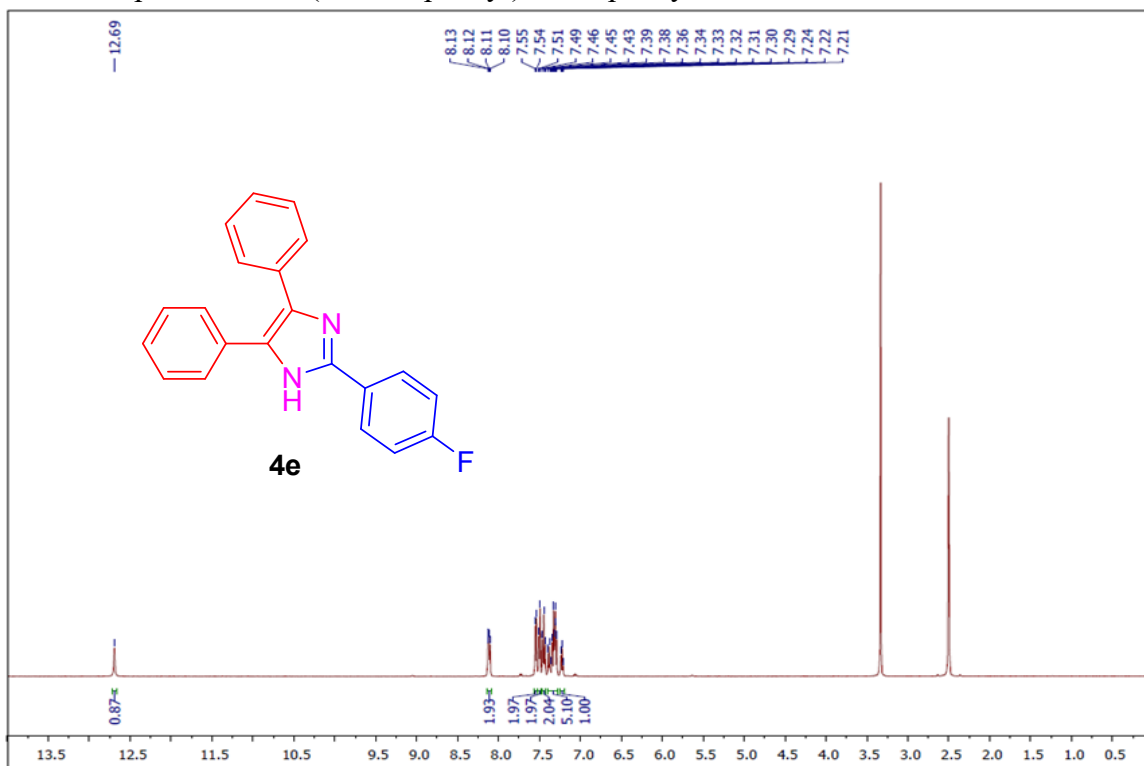


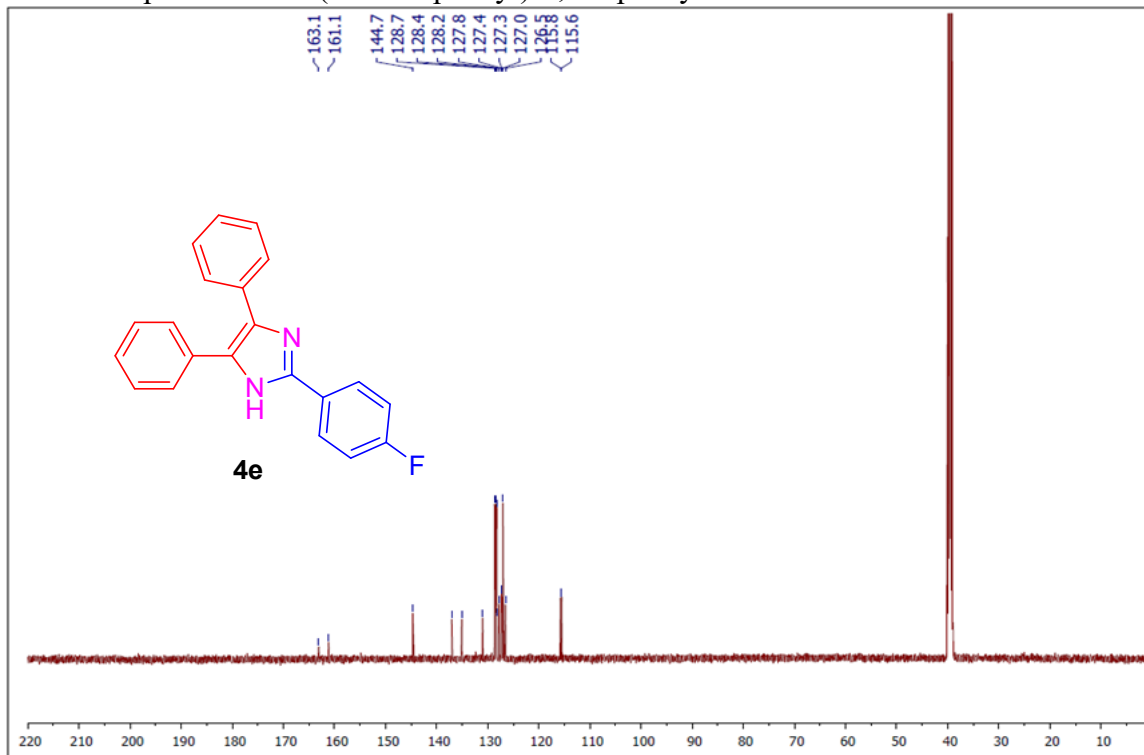
Figure 3. Preparation of Co-Cu oxide mixed phase **a.** *Euphorbia neriifolia* latex **b.** Latex + $\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$ **c.** Latex + $\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$ + $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$ **d.** gel of Co-Cu precursor **e.** sol of Co-Cu precursor

Spectral Data:

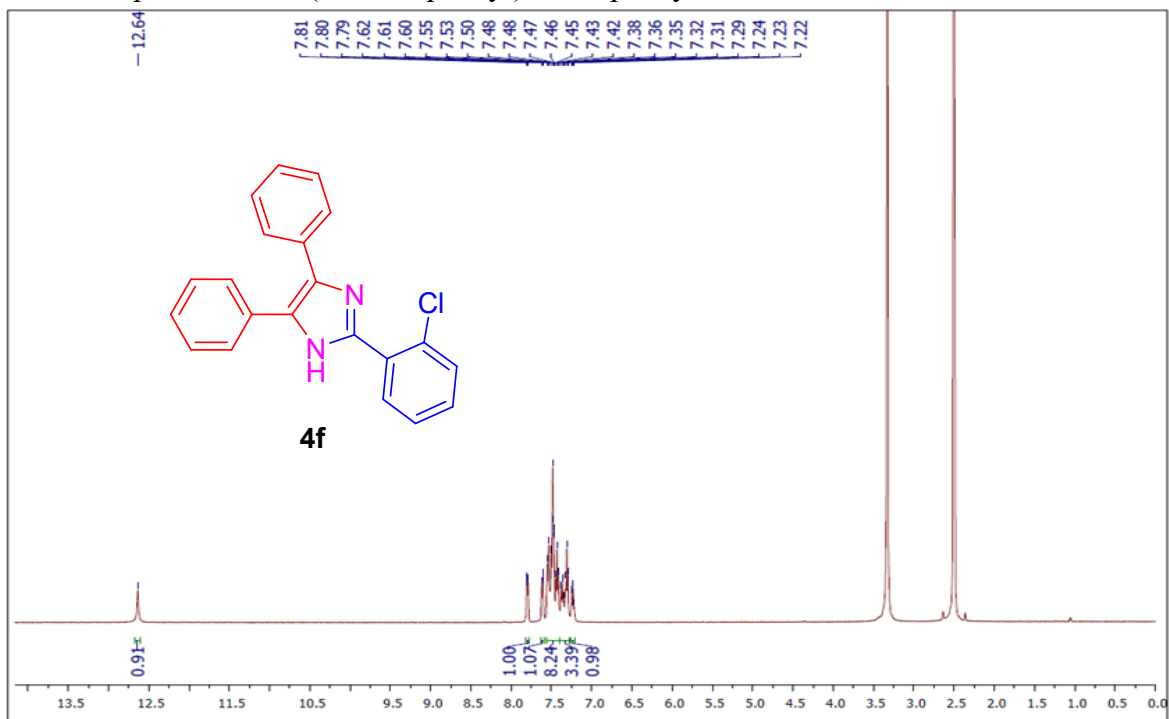
4e. ¹H-NMR spectrum of 2-(4-fluorophenyl)-4,5-diphenyl-1H-imidazole



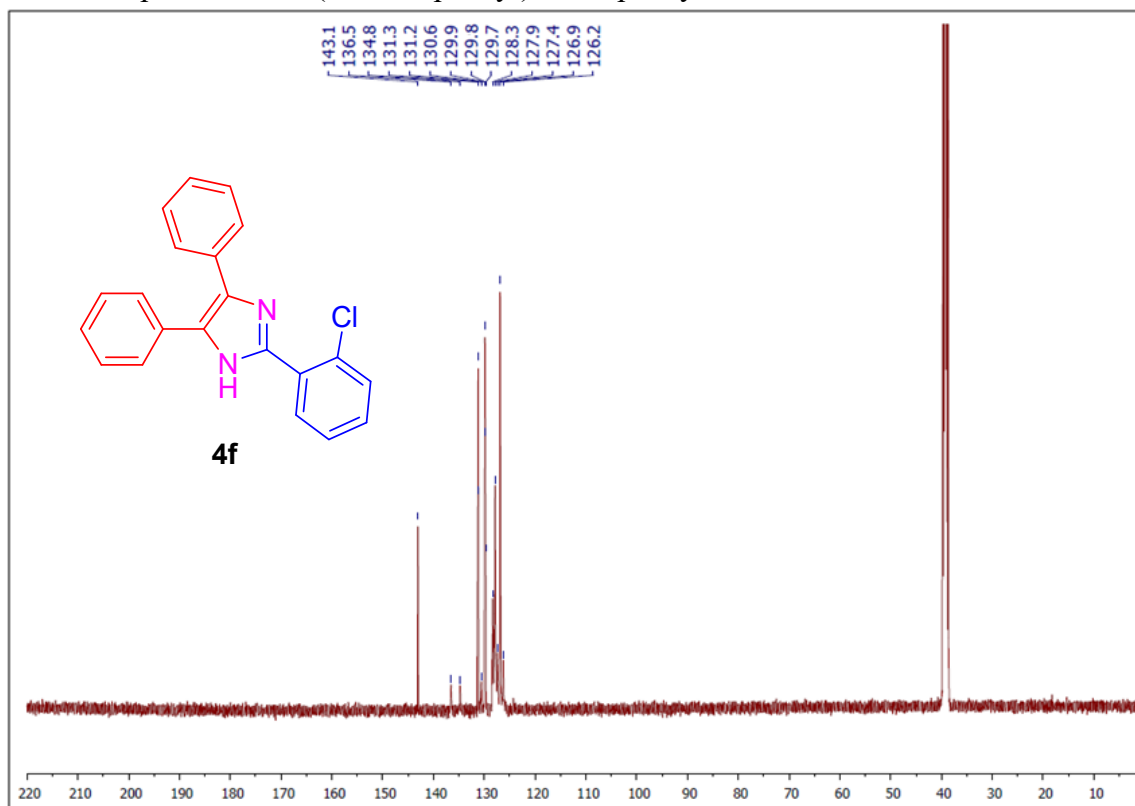
4e. ¹³C-NMR spectrum of 2-(4-fluorophenyl)-4,5-diphenyl-1H-imidazole



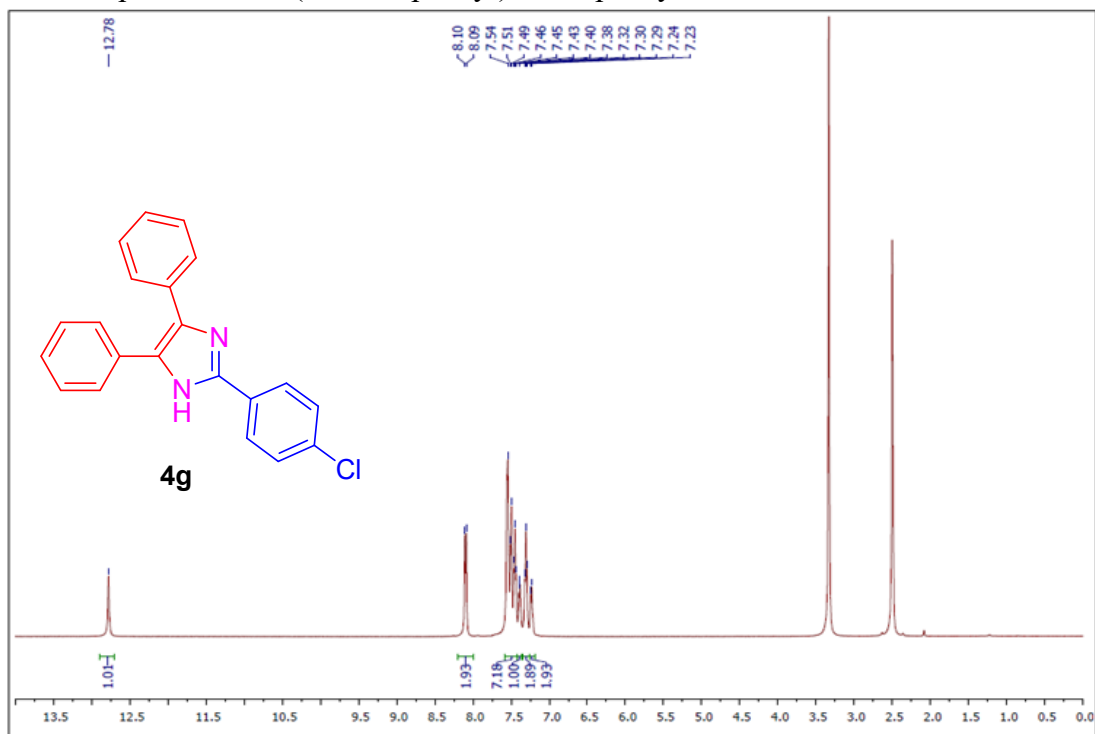
4f. ¹H-NMR spectrum of 2-(2-chlorophenyl)-4,5-diphenyl-1H-imidazole



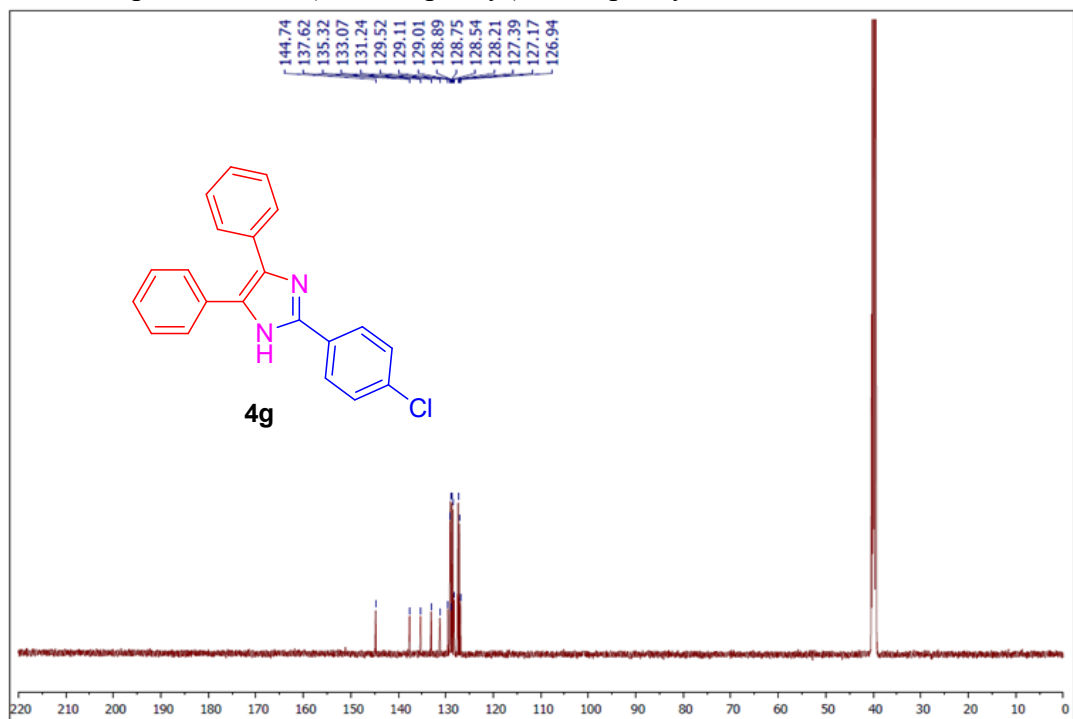
4f. ¹³C-NMR spectrum of 2-(2-chlorophenyl)-4,5-diphenyl-1H-imidazole



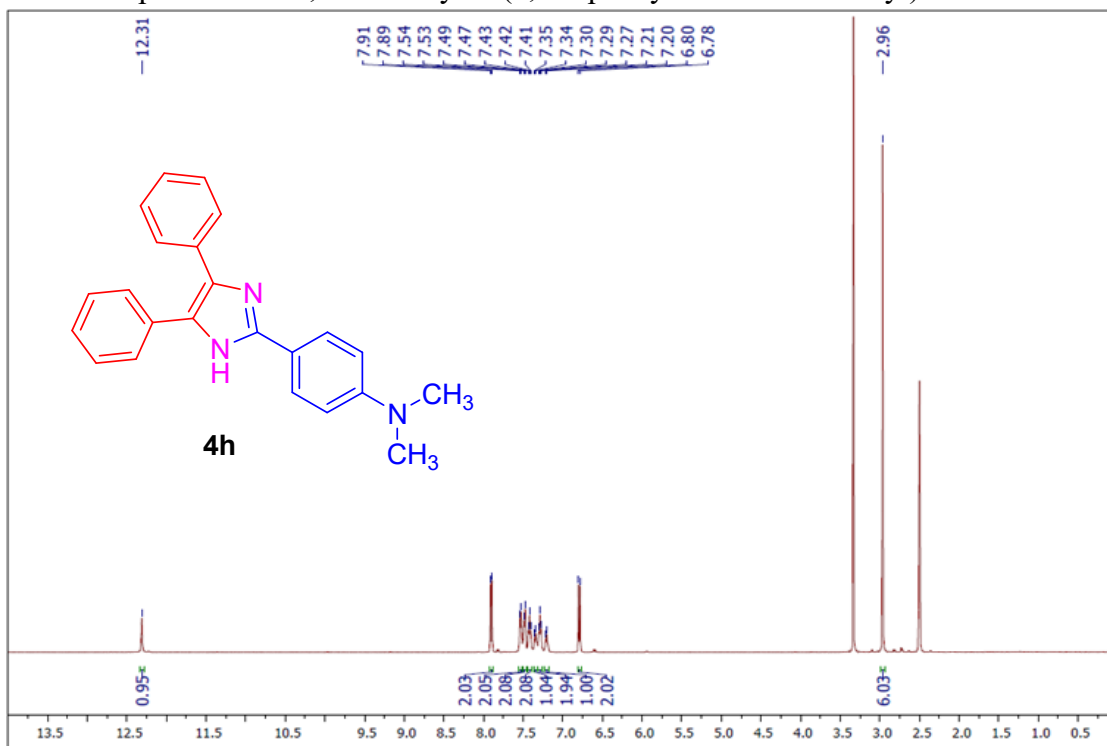
4g. ¹H-NMR spectrum of 2-(4-chlorophenyl)-4,5-diphenyl-1H-imidazole



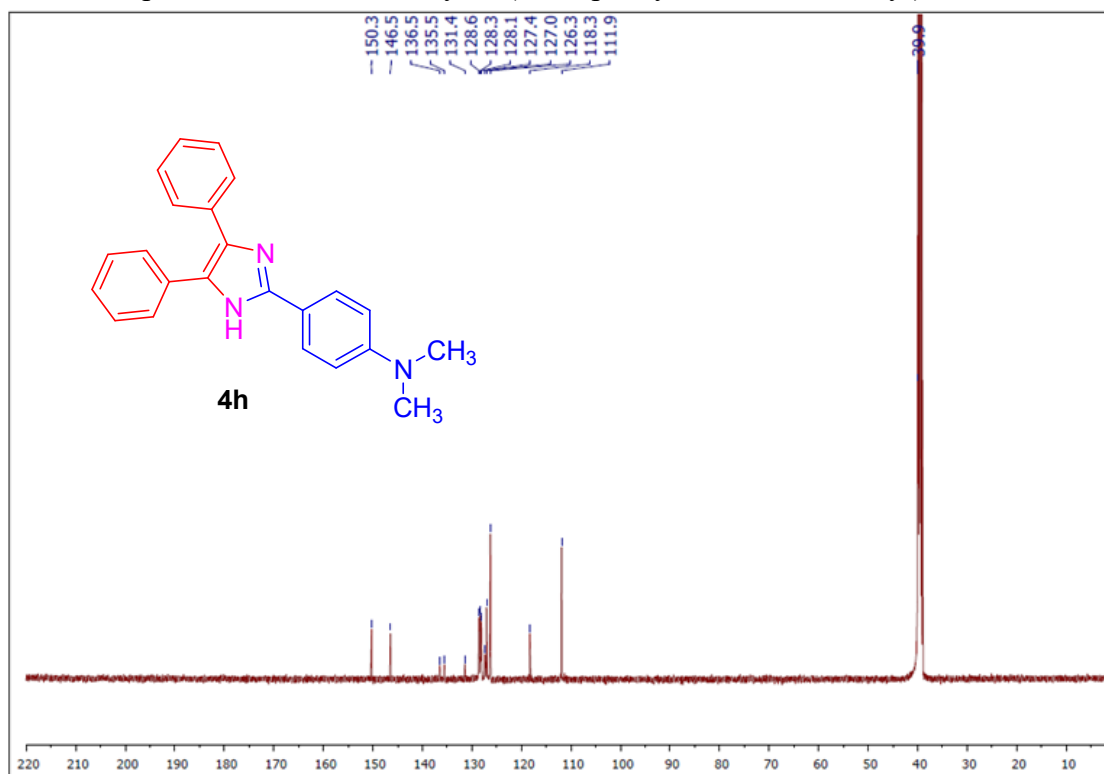
4g. ¹³C-NMR spectrum of 2-(4-chlorophenyl)-4,5-diphenyl-1H-imidazole



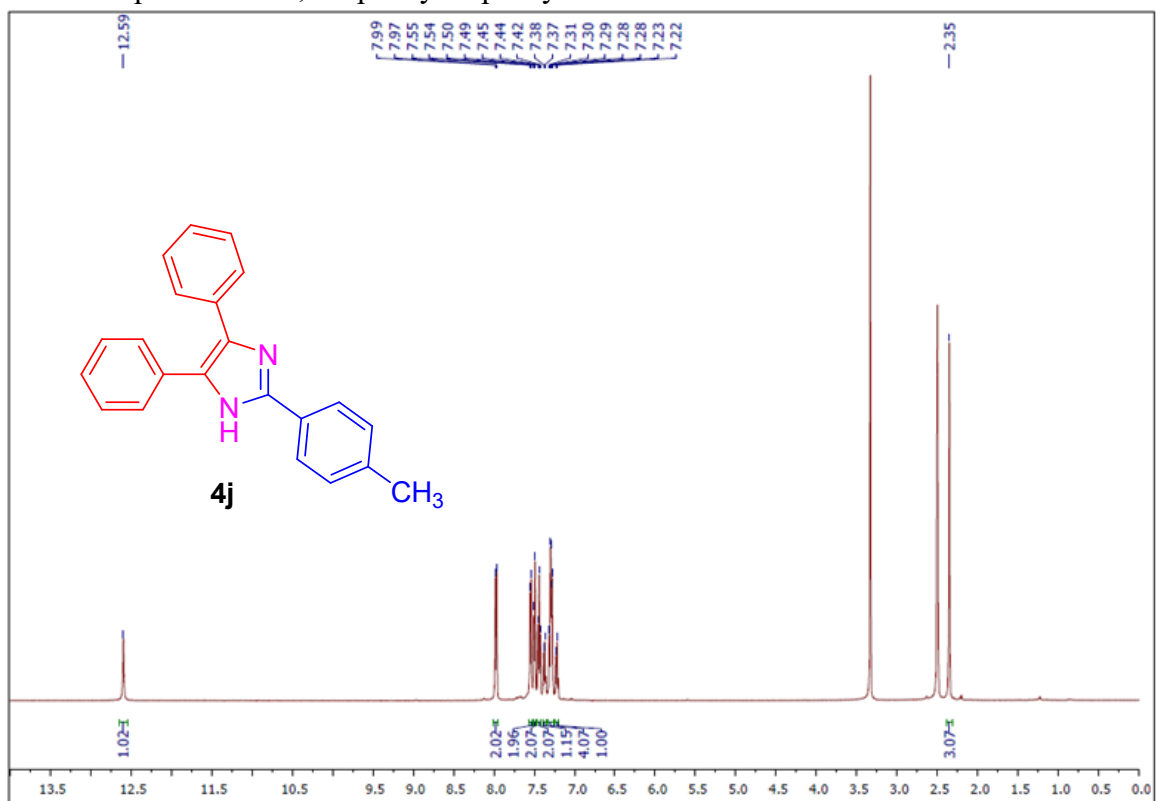
4h. ¹H-NMR spectrum of N,N-dimethyl-4-(4,5-diphenyl-1H-imidazol-2-yl)benzenamine



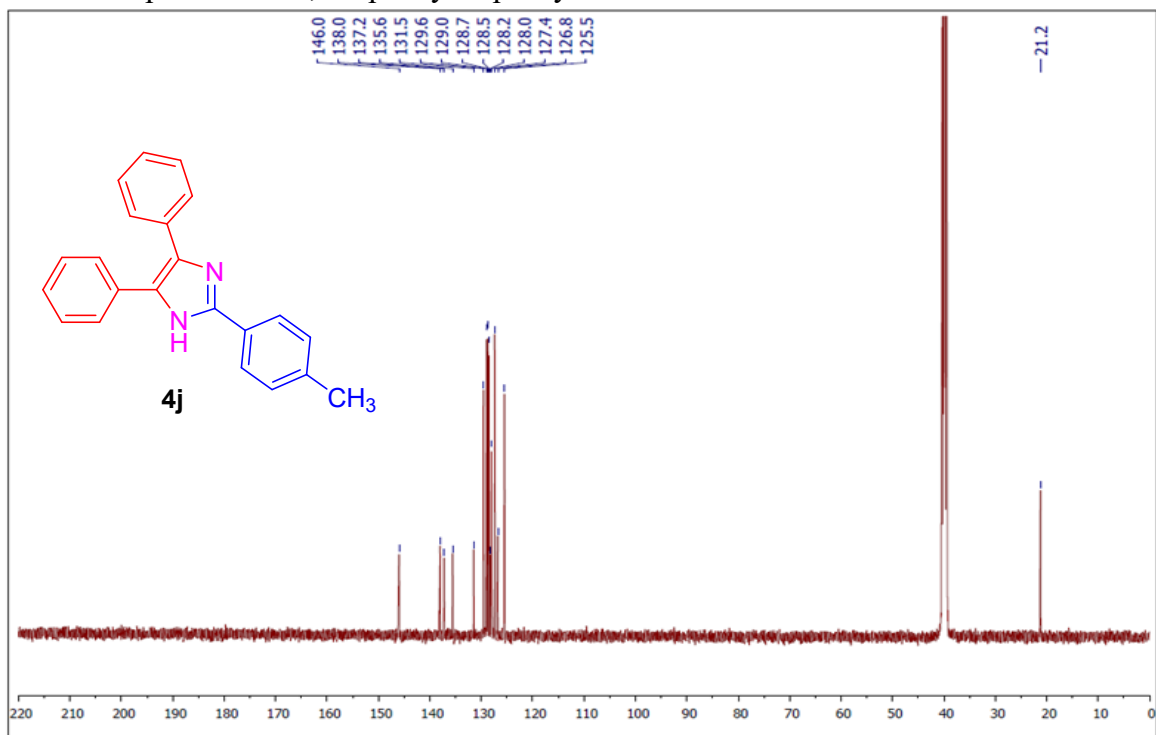
4h. ¹³C-NMR spectrum of N,N-dimethyl-4-(4,5-diphenyl-1H-imidazol-2-yl)benzenamine



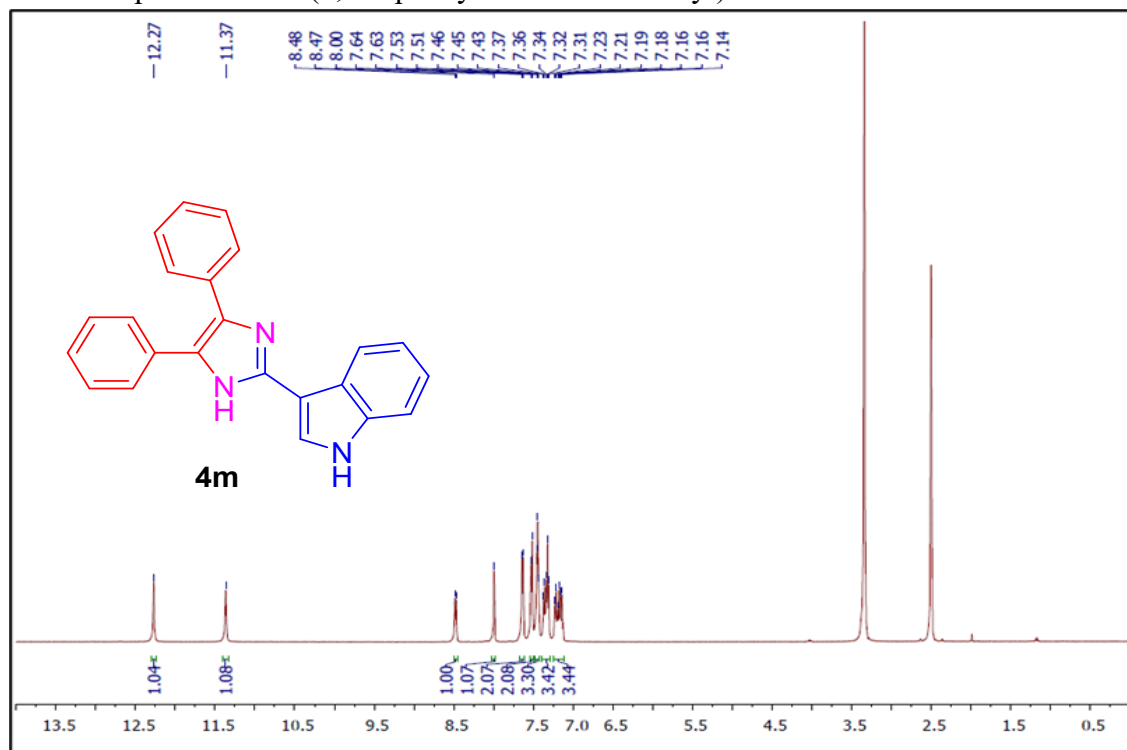
4j. $^1\text{H-NMR}$ spectrum of 4,5-diphenyl-2-p-tolyl-1H-imidazole



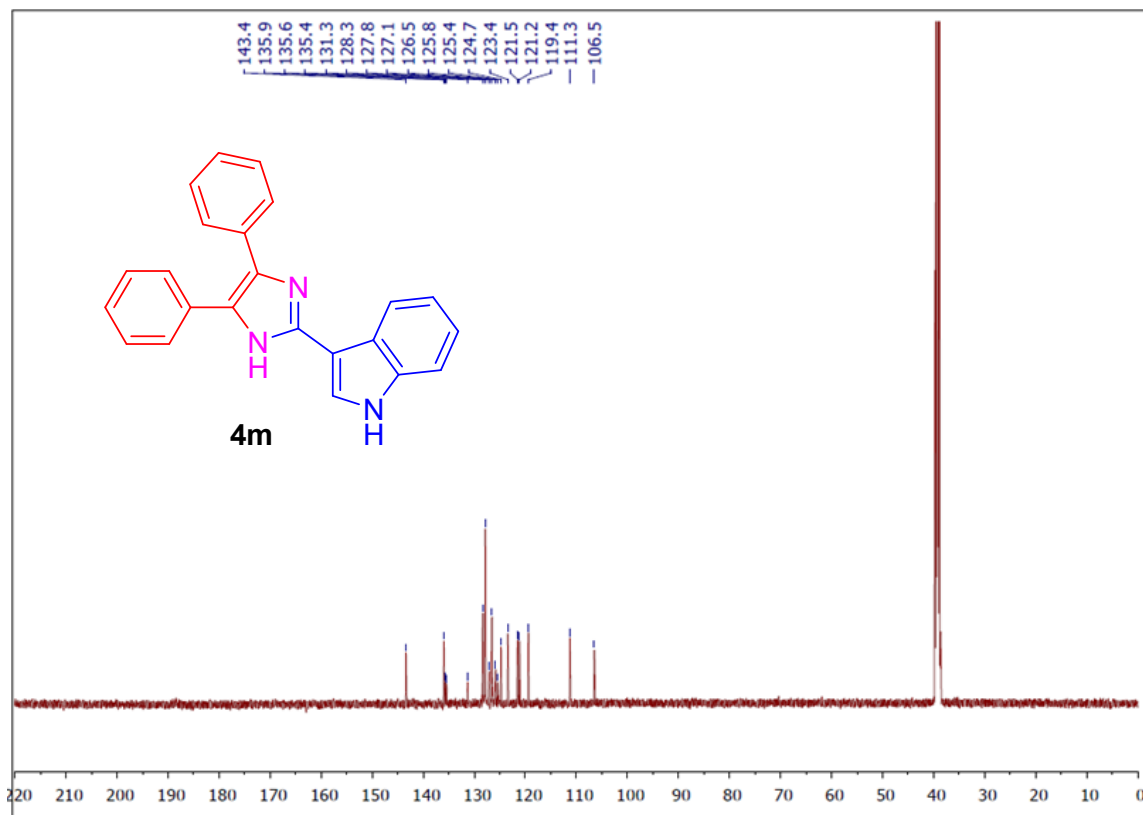
4j. $^{13}\text{C-NMR}$ spectrum of 4,5-diphenyl-2-p-tolyl-1H-imidazole



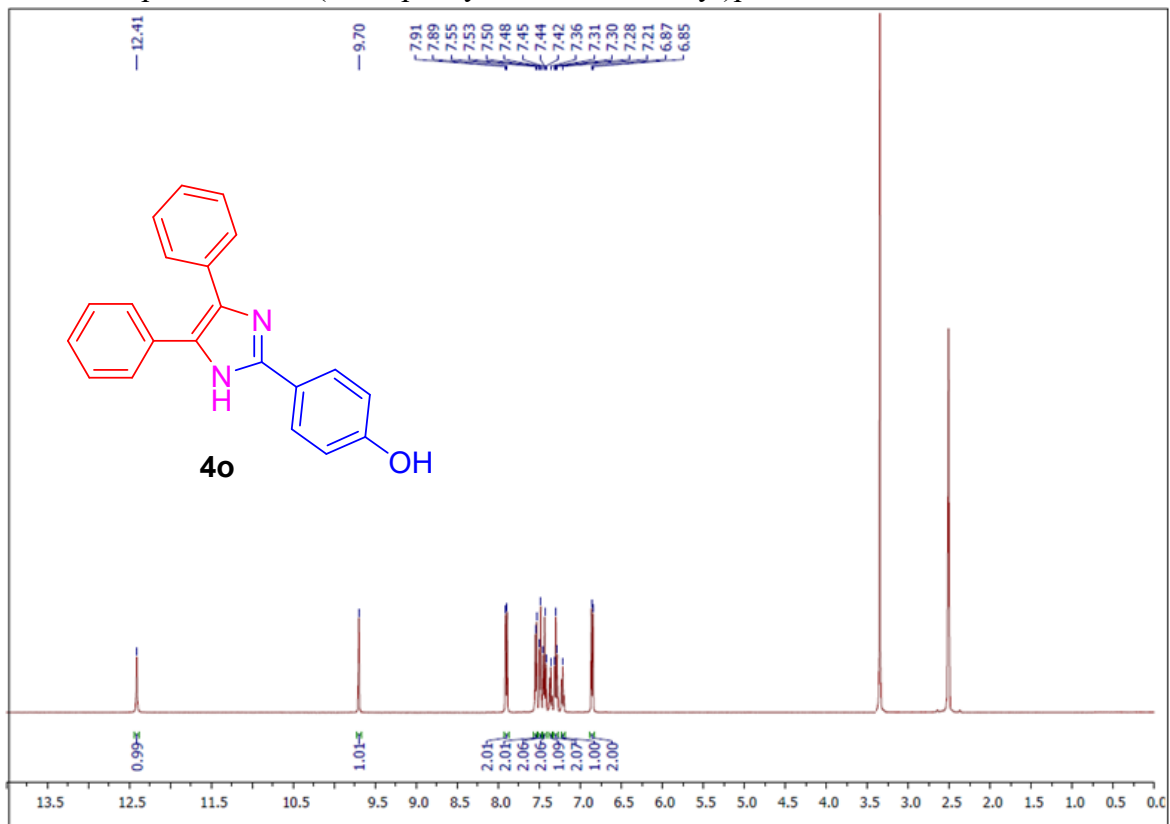
4m. $^1\text{H-NMR}$ spectrum of 3-(4,5-diphenyl-1H-imidazol-2-yl)-1H-indole



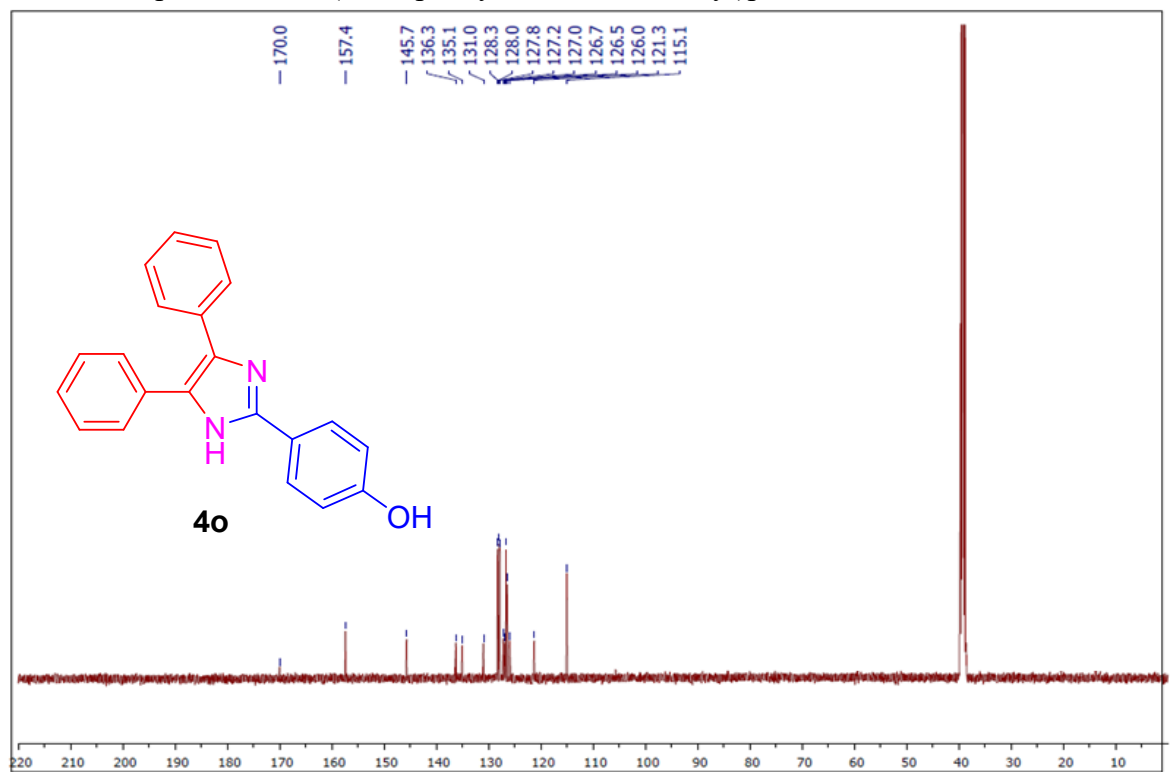
4m. $^{13}\text{C-NMR}$ spectrum of 3-(4,5-diphenyl-1H-imidazol-2-yl)-1H-indole



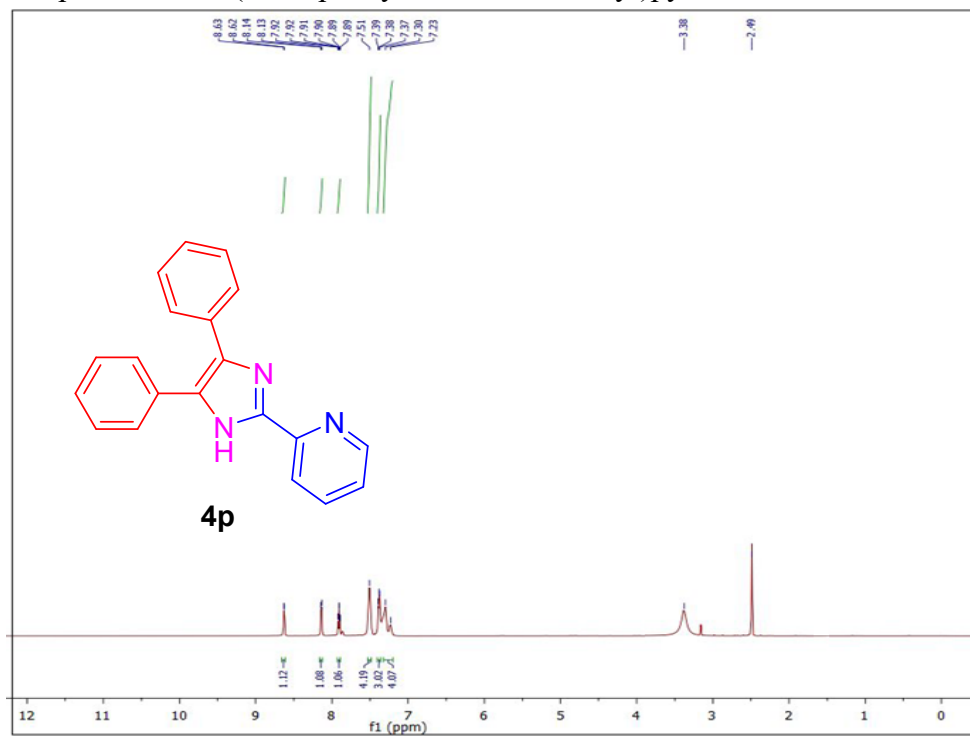
4o. ¹H-NMR spectrum of 4-(4,5-diphenyl-1H-imidazol-2-yl)phenol



4o. ¹³C-NMR spectrum of 4-(4,5-diphenyl-1H-imidazol-2-yl)phenol



4p. $^1\text{H-NMR}$ spectrum of 2-(4,5-diphenyl-1H-imidazol-2-yl)pyridine



4p. $^{13}\text{C-NMR}$ spectrum of 2-(4,5-diphenyl-1H-imidazol-2-yl)pyridine

