Supporting information

An efficient and eco-compatible multicomponent synthesis of 2,4,5-trisubstituted imidazole derivatives via modified-silica coated cobalt ferrite nanoparticles by Tungstic acid

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General synthetic process for tri-substituted imidazole derivatives

Accurate amounts of benzil (1 mmol), benzaldehyde (1 mmol), ammonium acetate (2 mmol) and $CoFe_2O_4@SiO_2@(-CH_2)_3OWO_3H$ (0.01 g) were stirred under neat condition at 110 ^oC for 15-50 min. After the reaction was supplemented (TLC), the mixture was dissolved in ethanol and the catalyst was separated by an external magnet, washed several times with acetone and dried at 100^oC for 5 h in the oven for reusing in subsequent cycles. Eventually, few drops of ice-cold water were added to the remaining solution and the precipitate was washed by petroleum ether and recrystallized from ethanol or acetone-water mixture, if needed, to give pure target products. Every single product was verified by reconciling its melting point in literatures and using spectroscopic methods such as FT-IR and ^1H NMR.

FT-IR and ^{1}H NMR Spectra of synthesized 2,4,5-trisubstituted imidazole derivatives:

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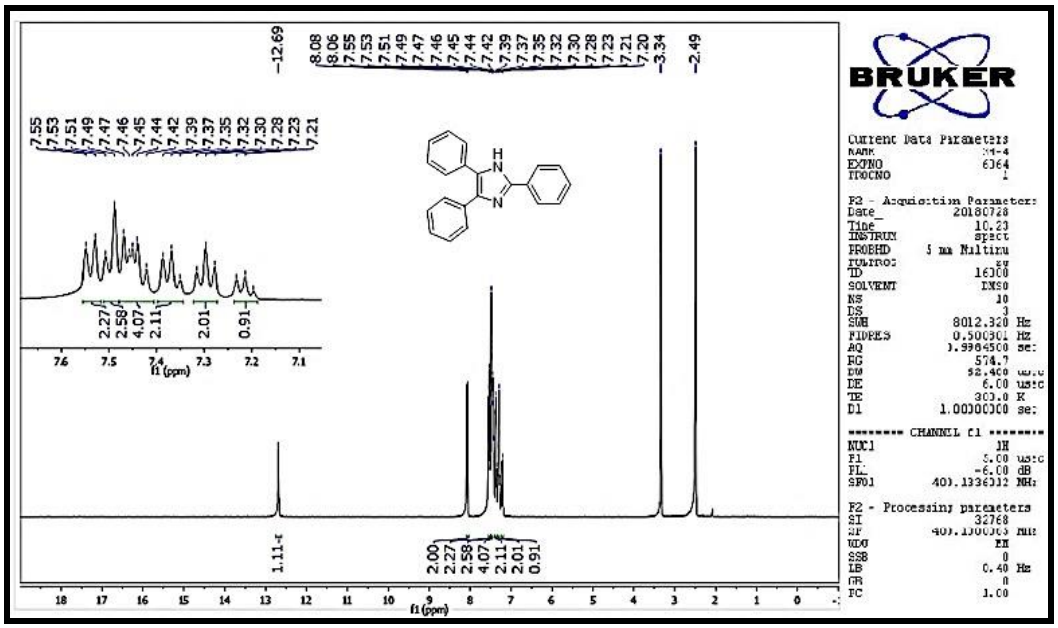
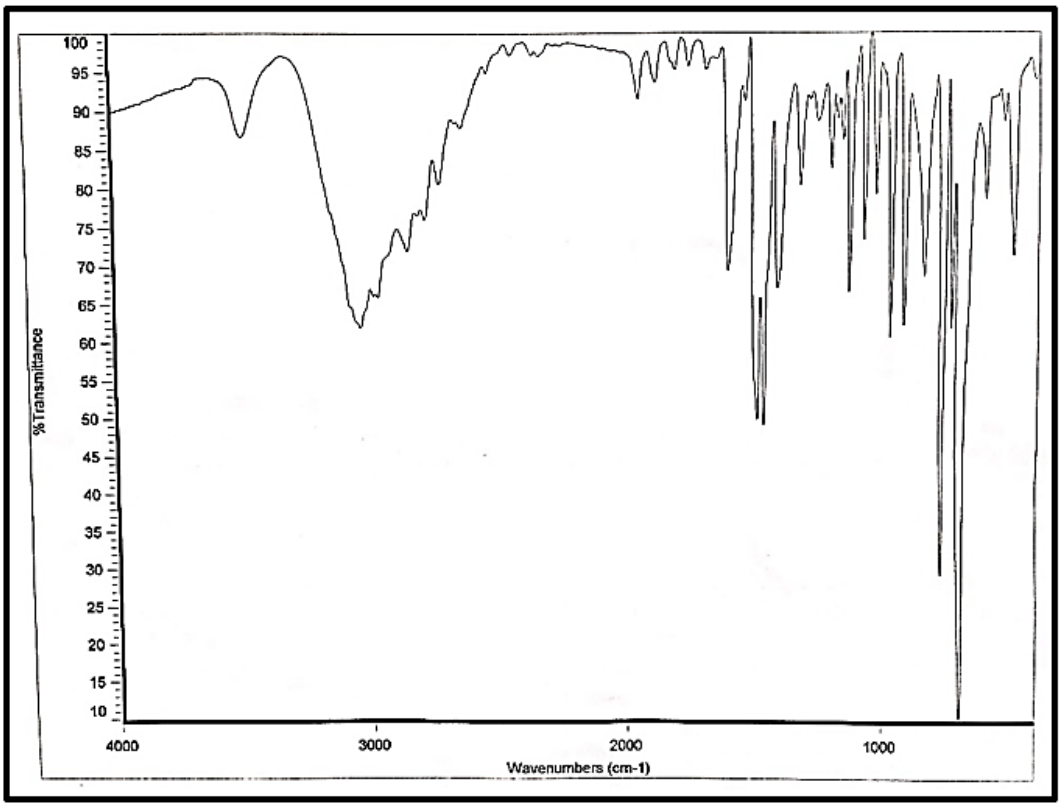


^{1}H NMR of **4a**



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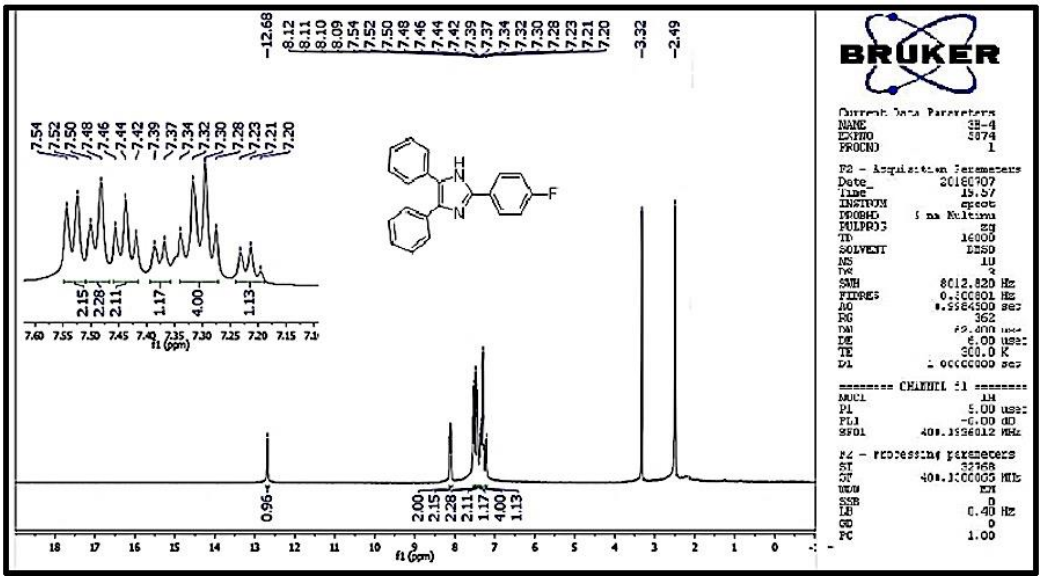

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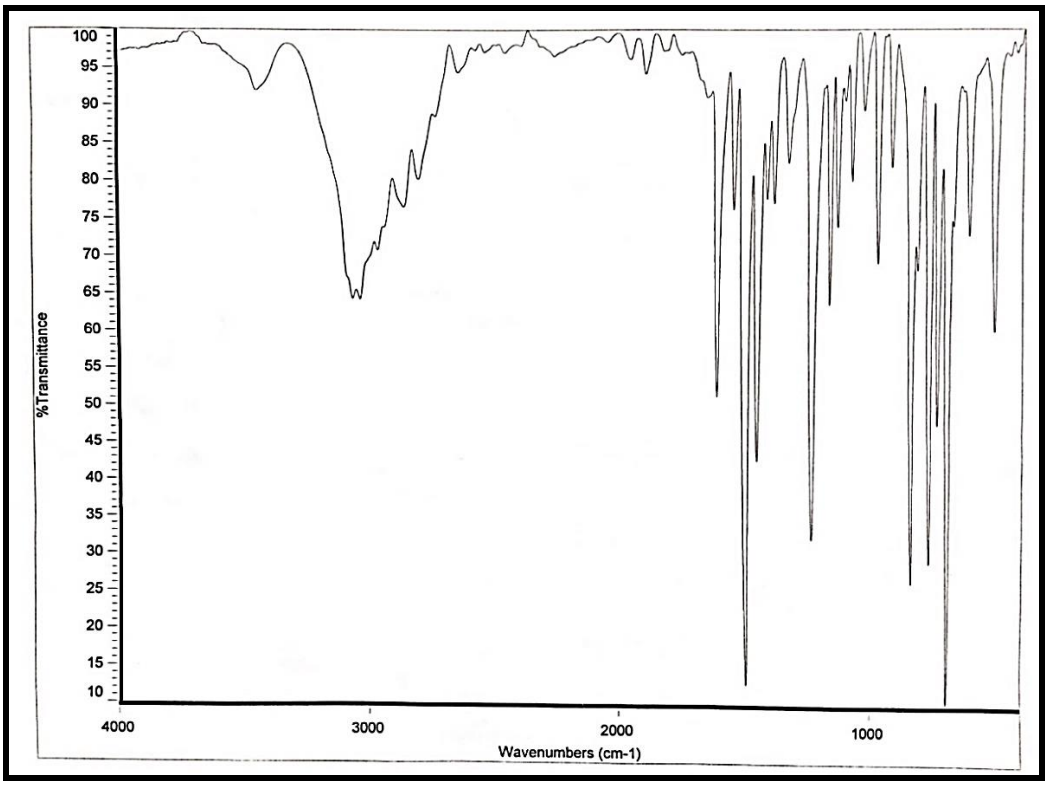

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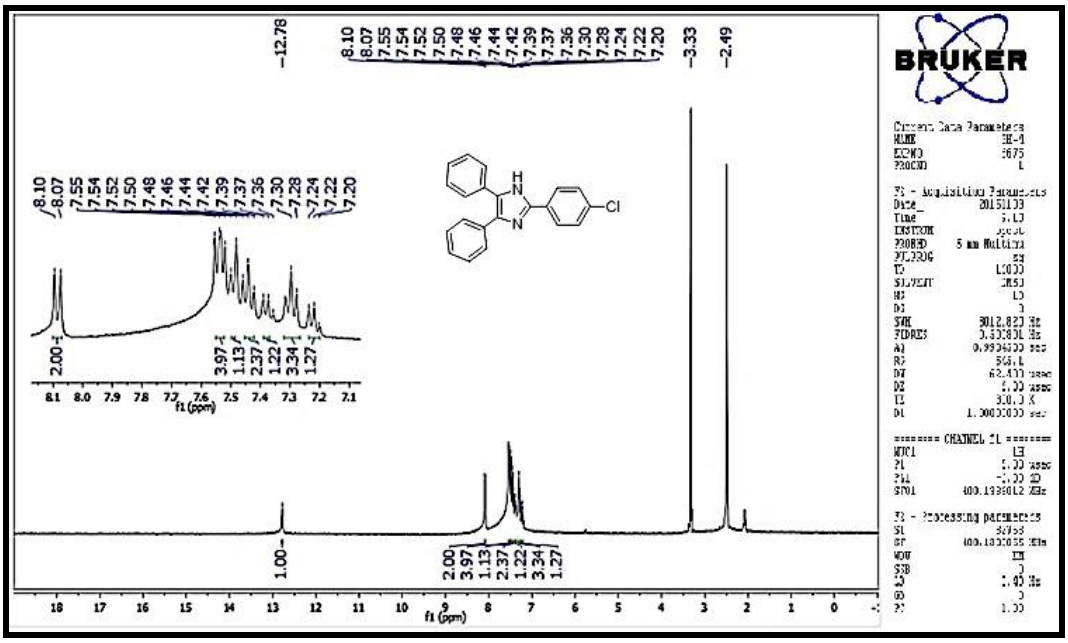

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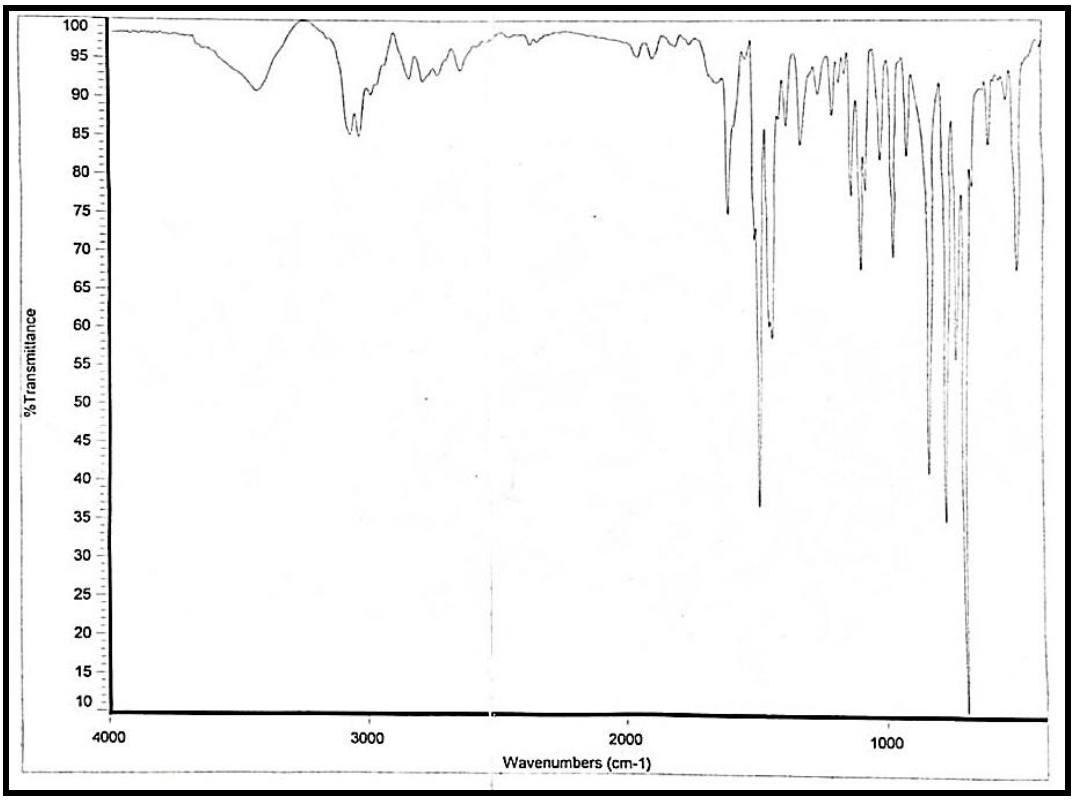

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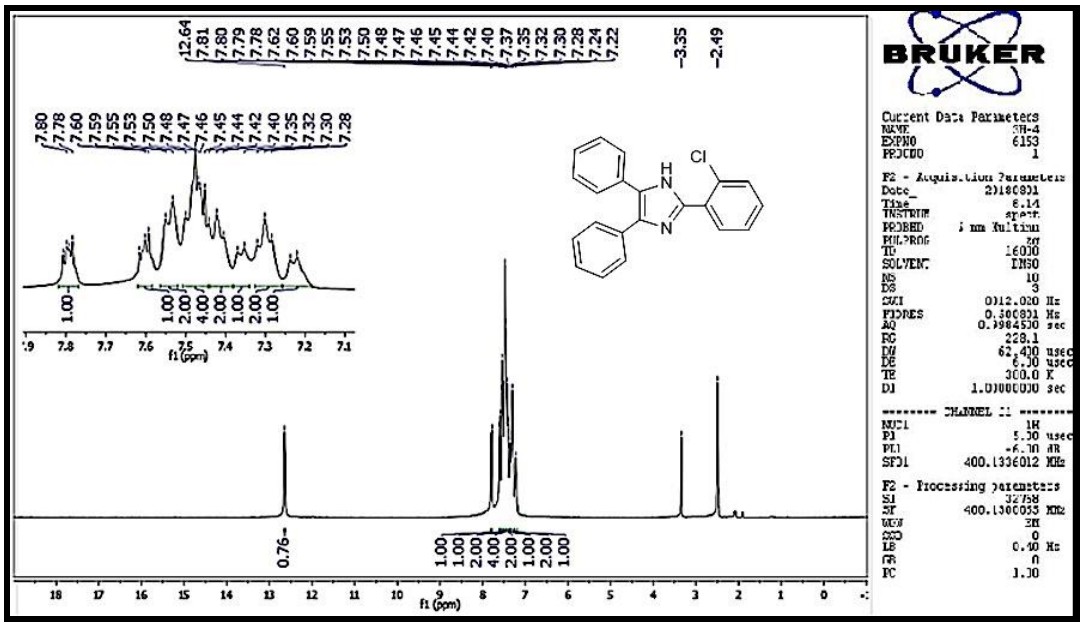

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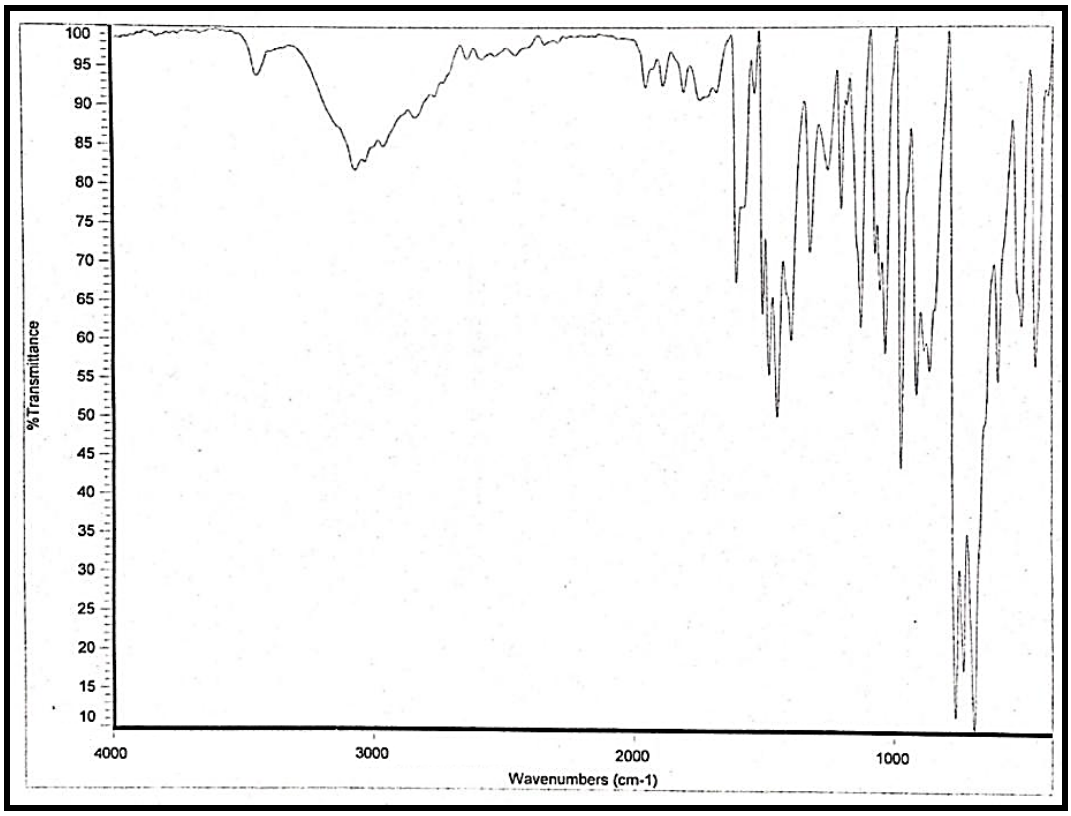

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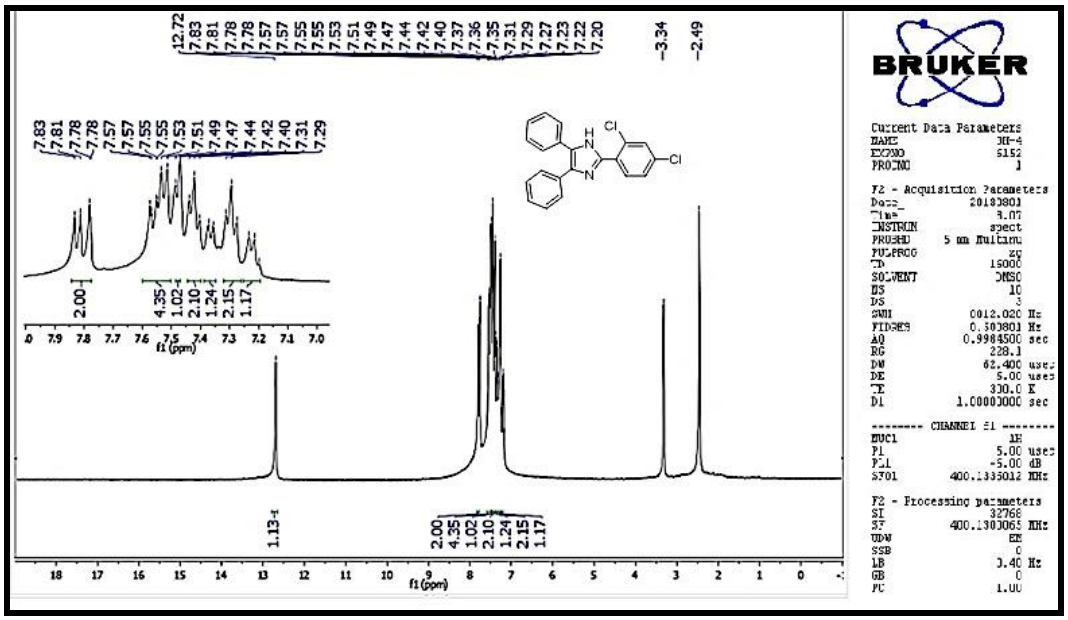

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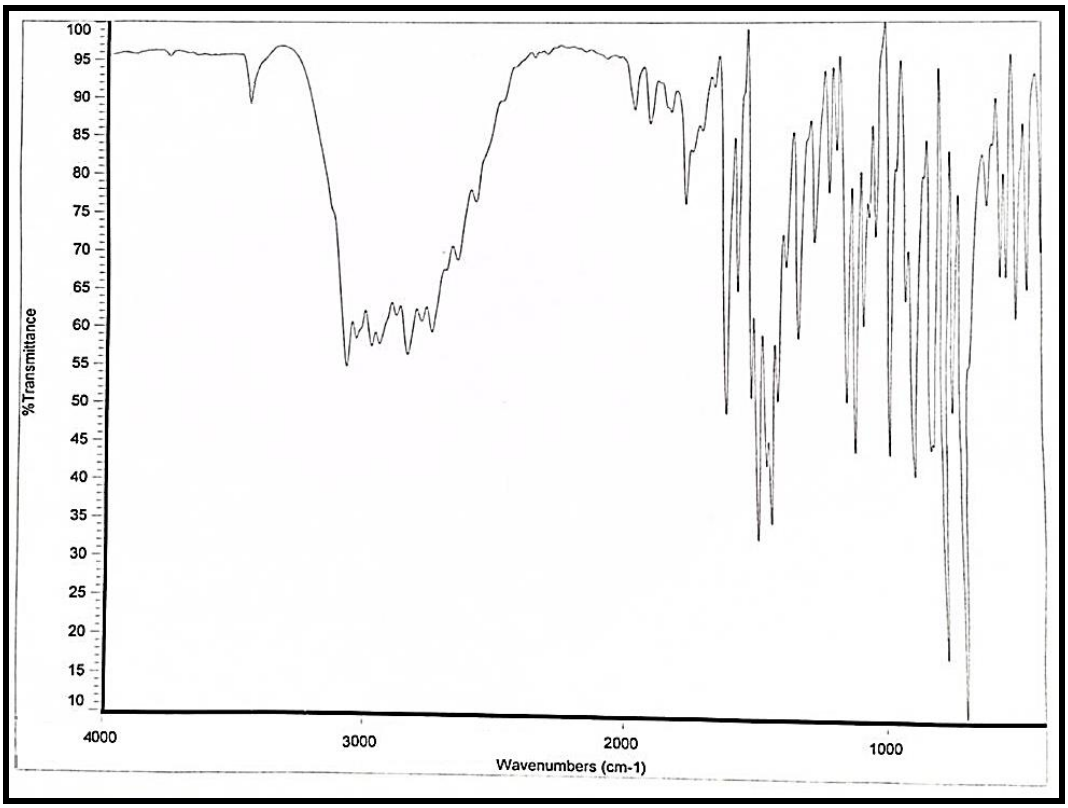

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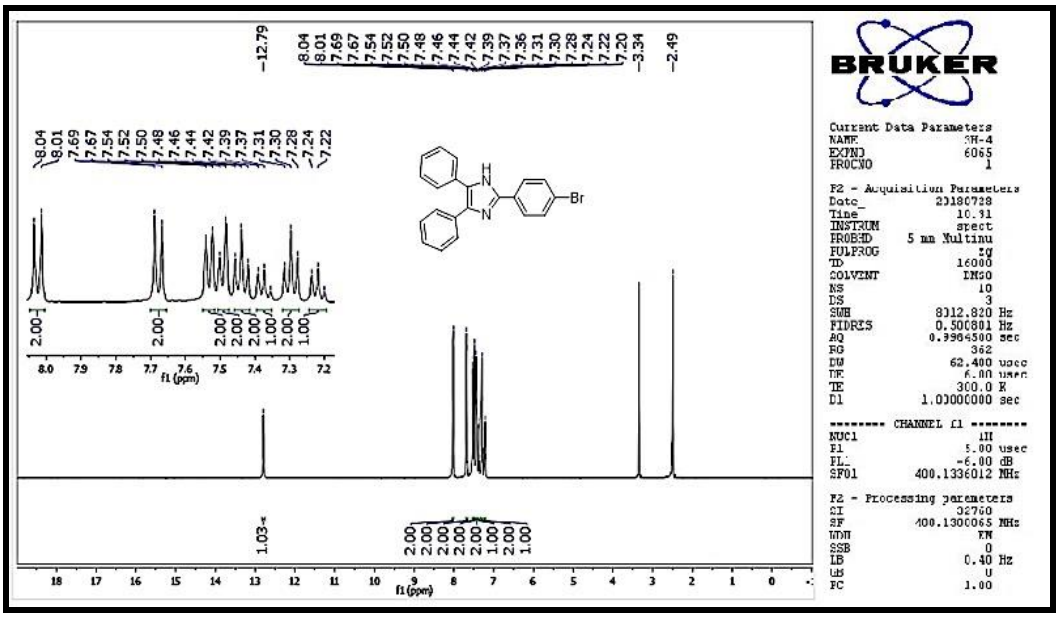

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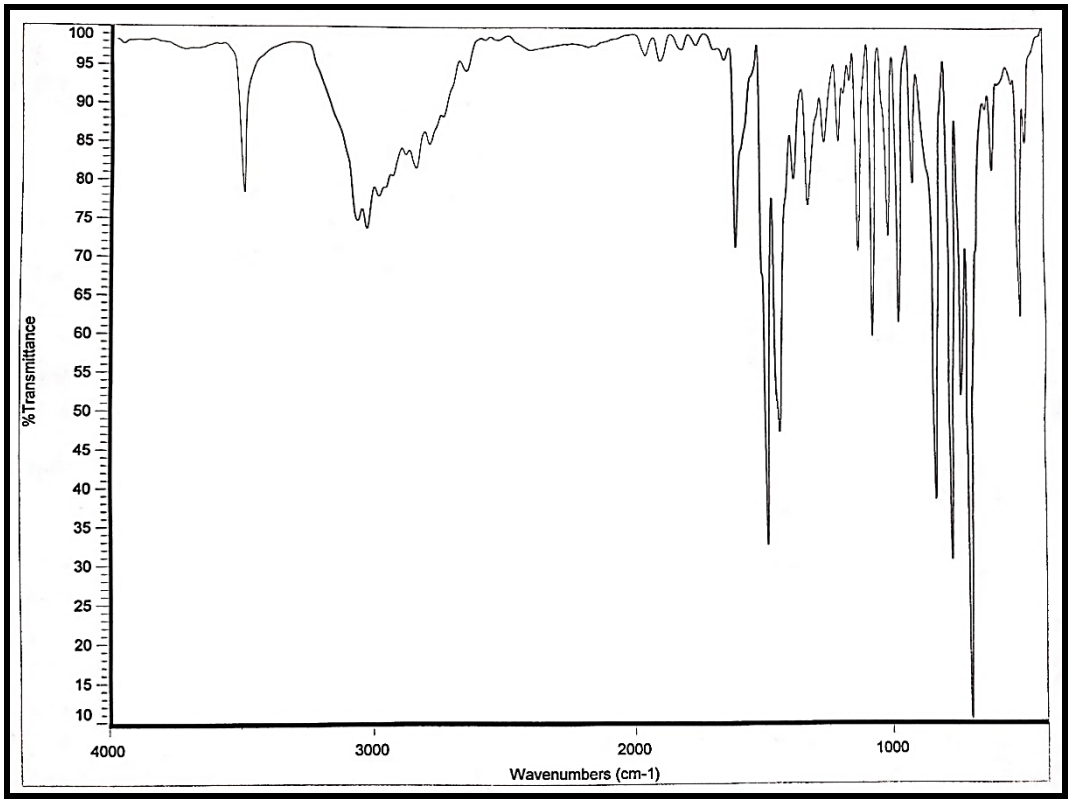

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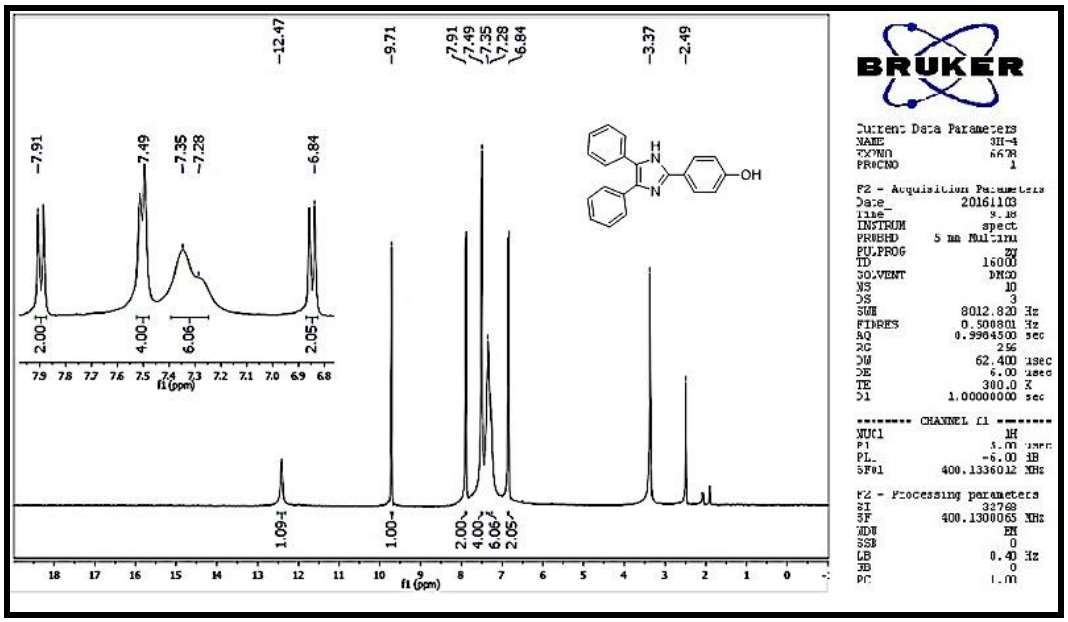

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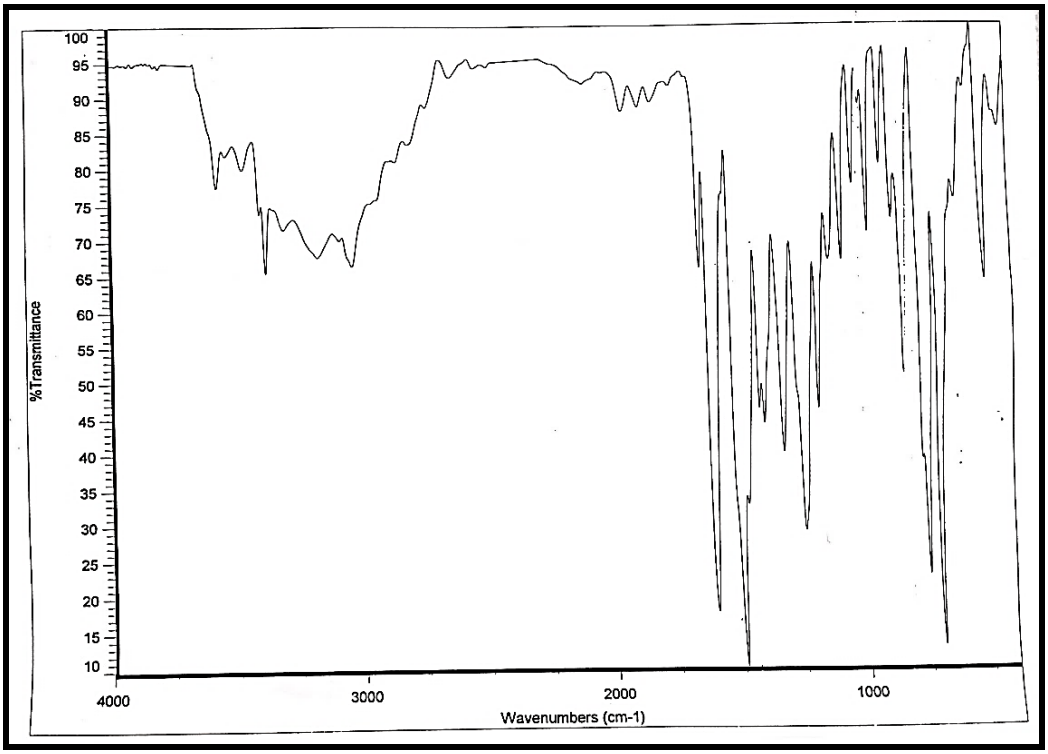

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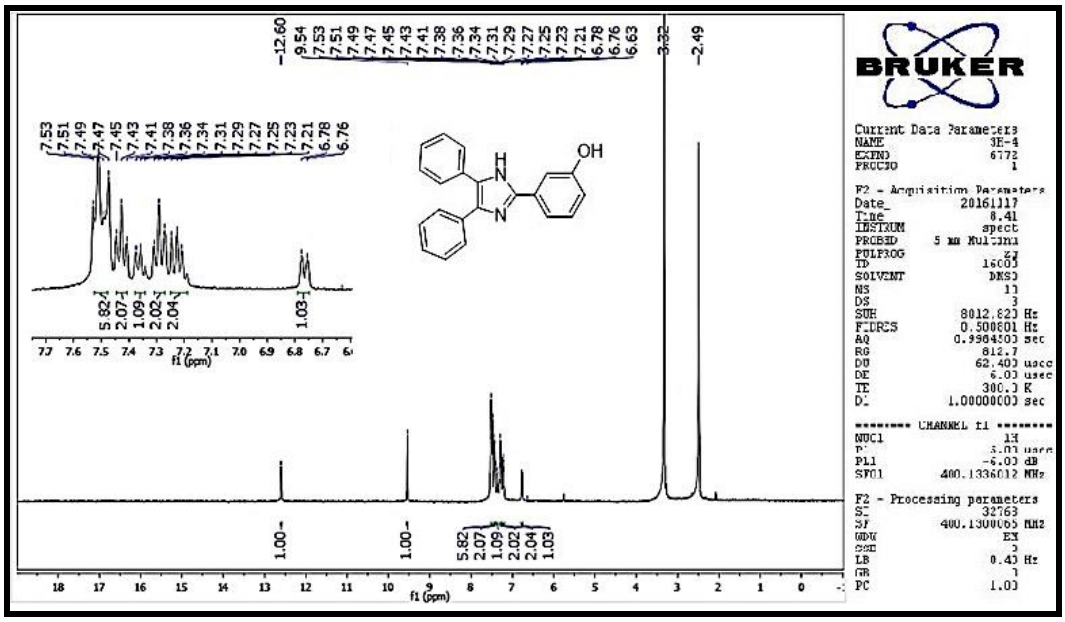

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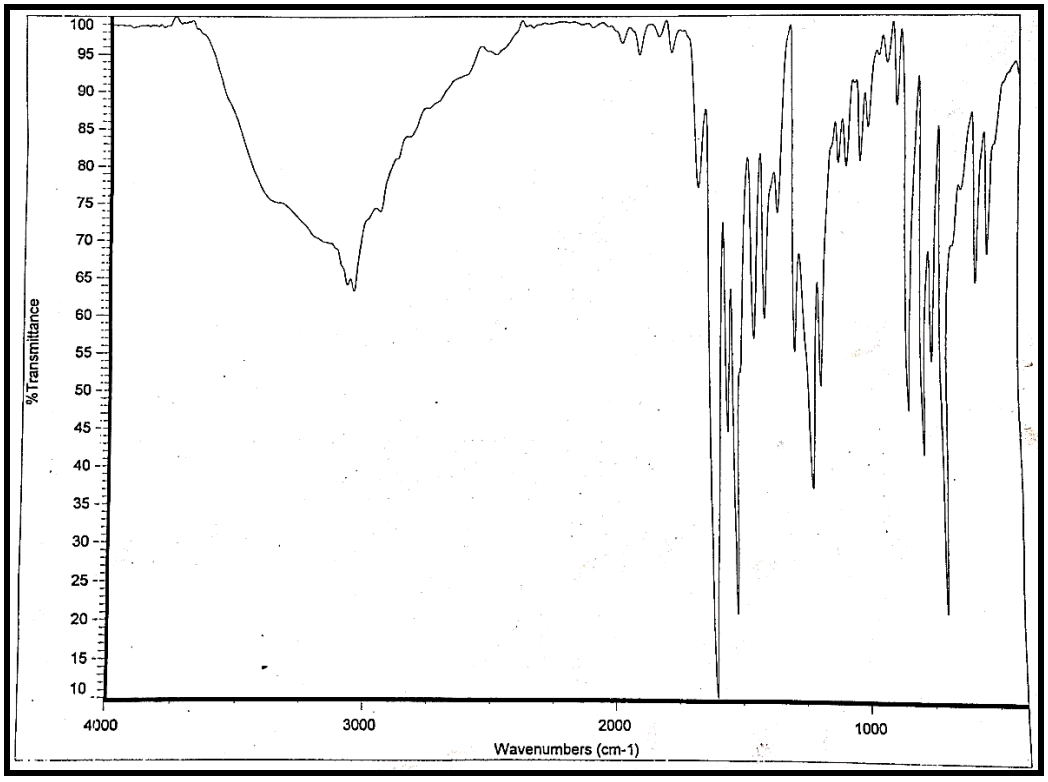

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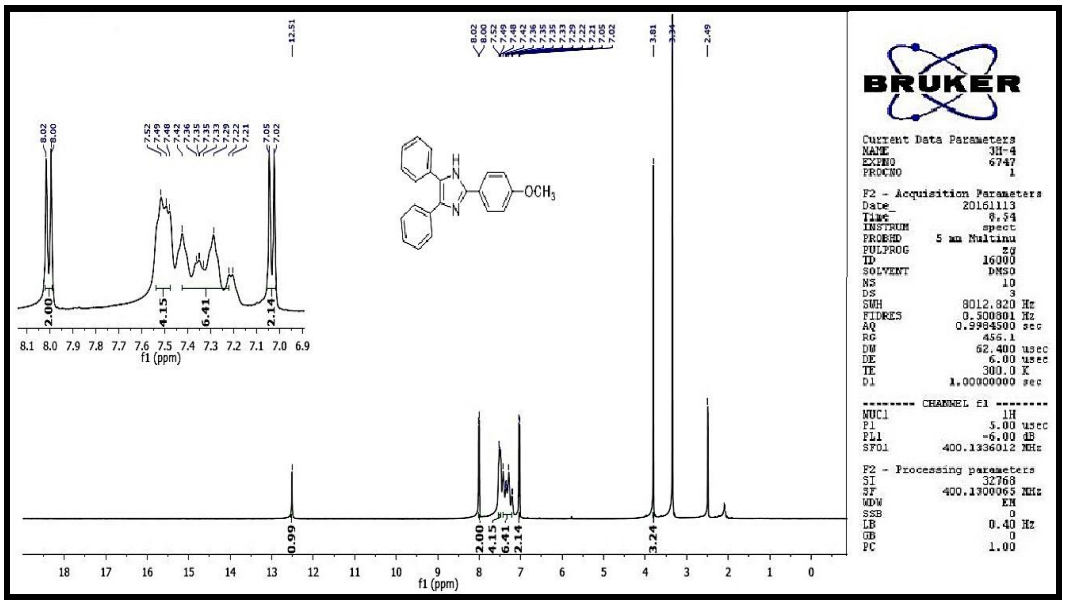

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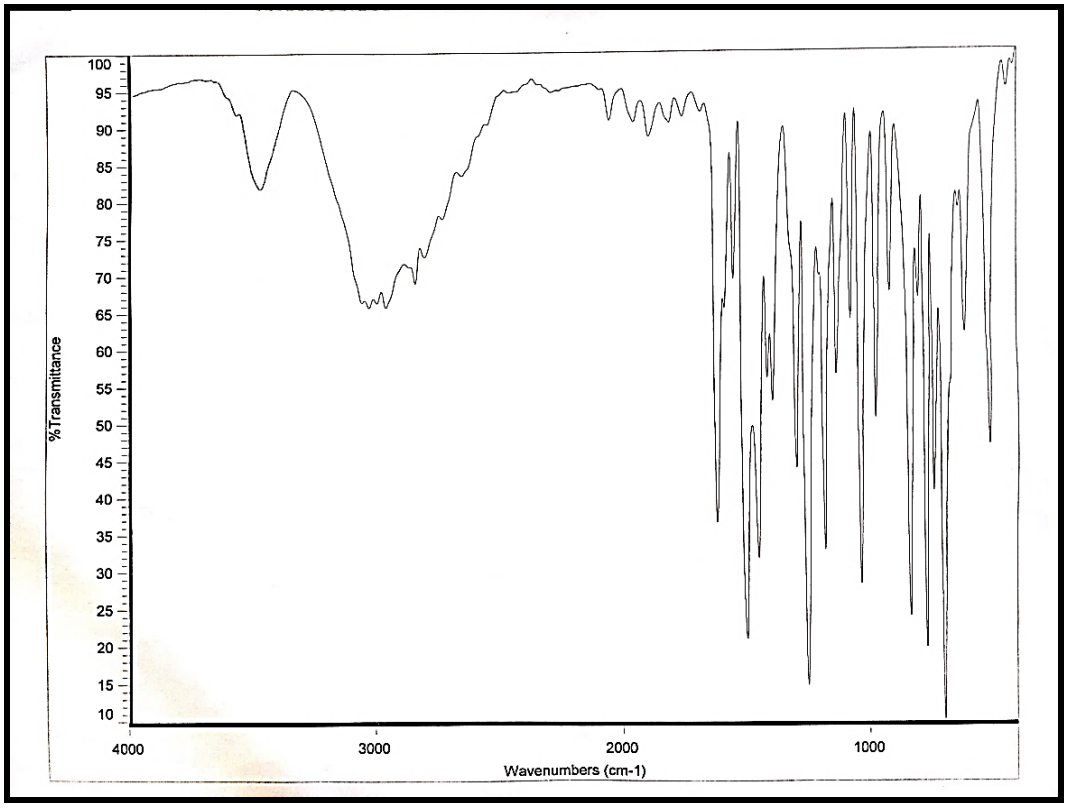

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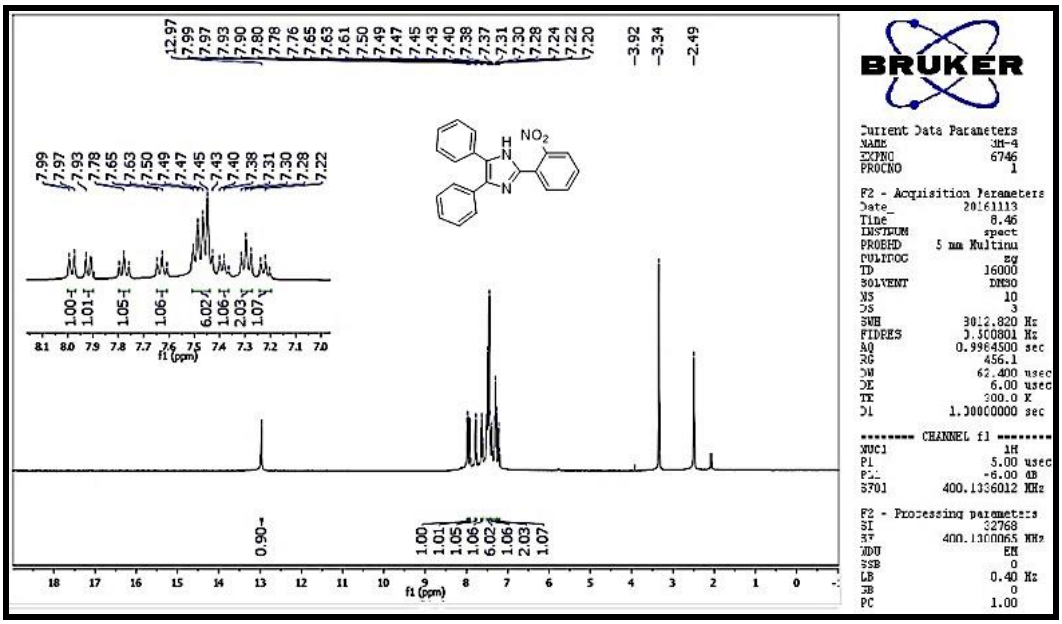

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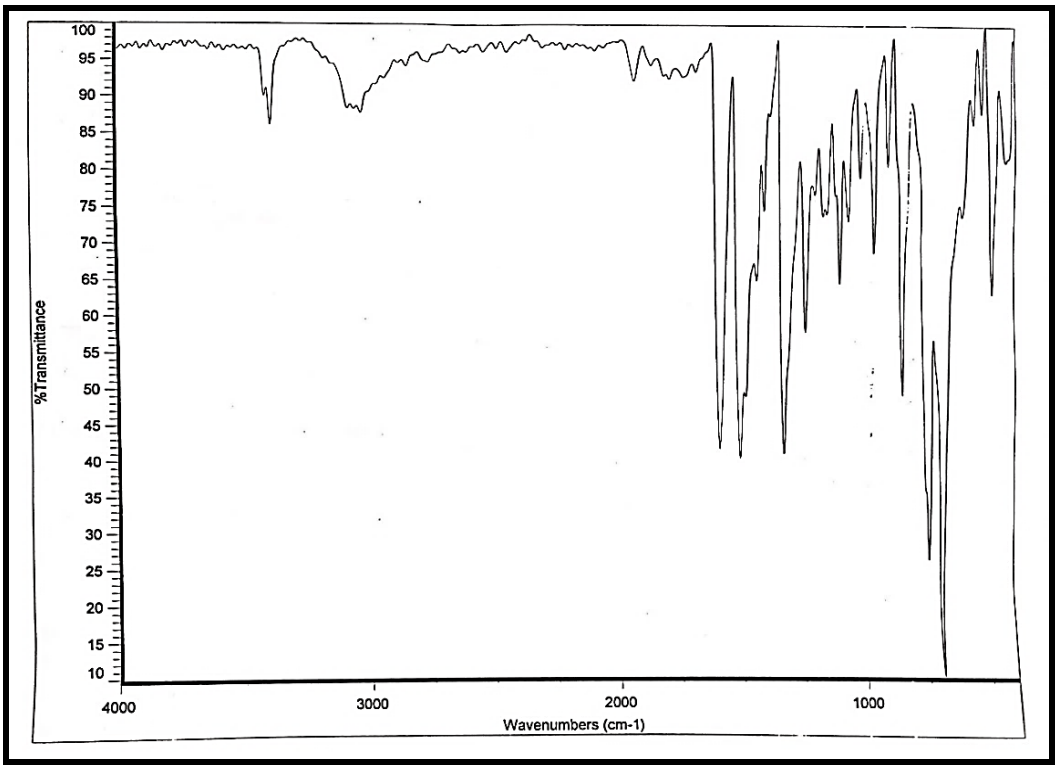

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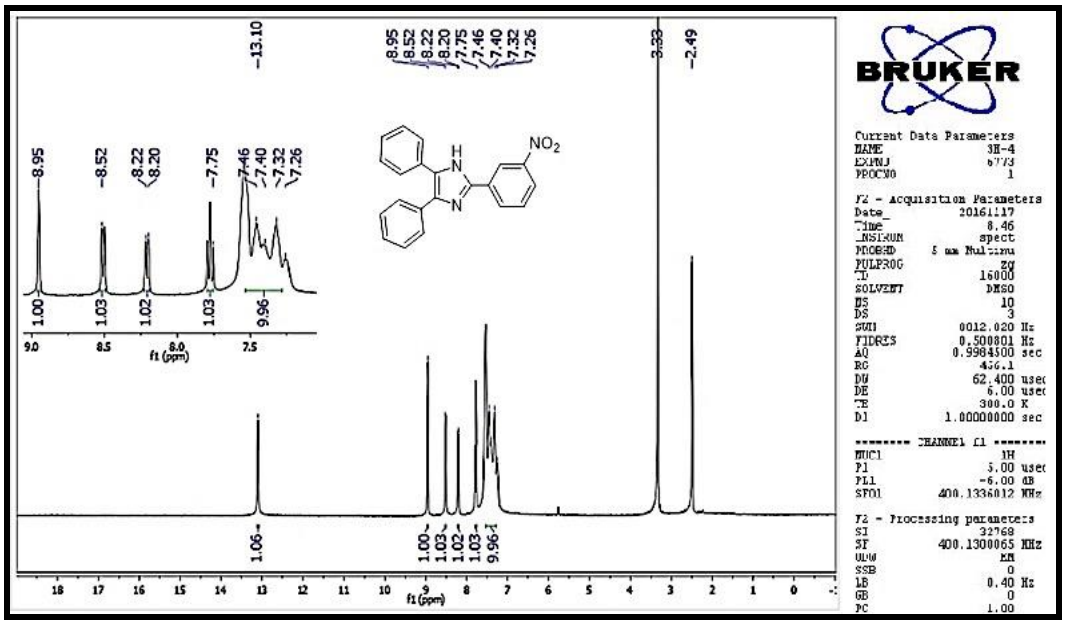

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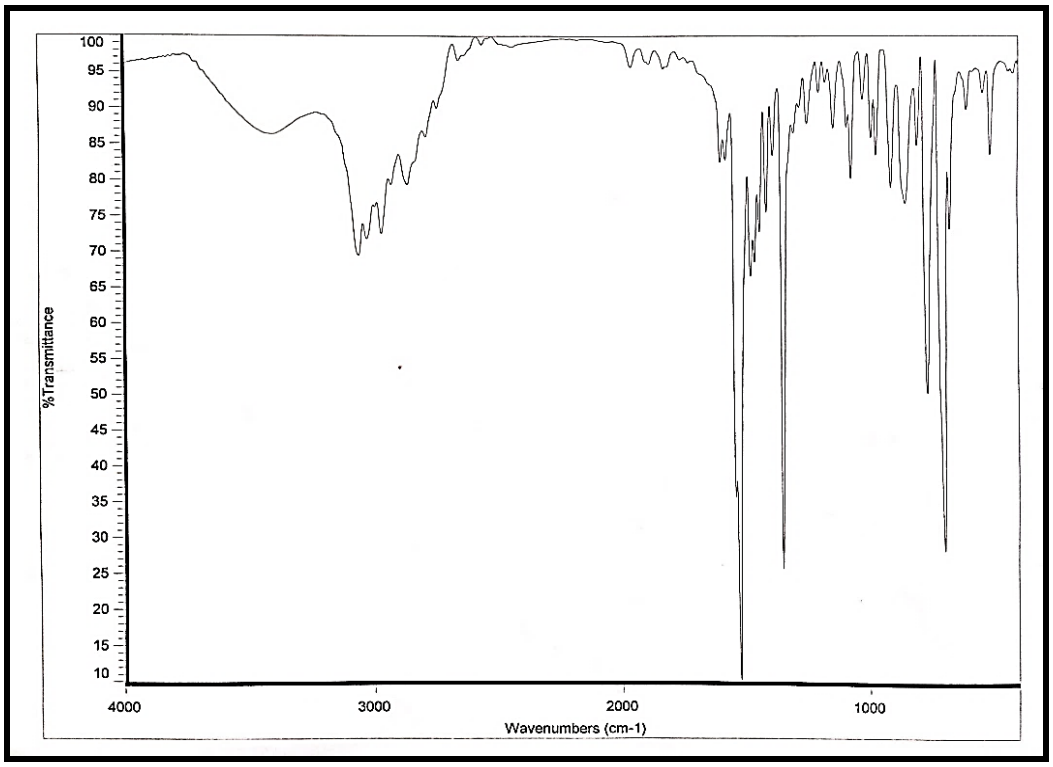

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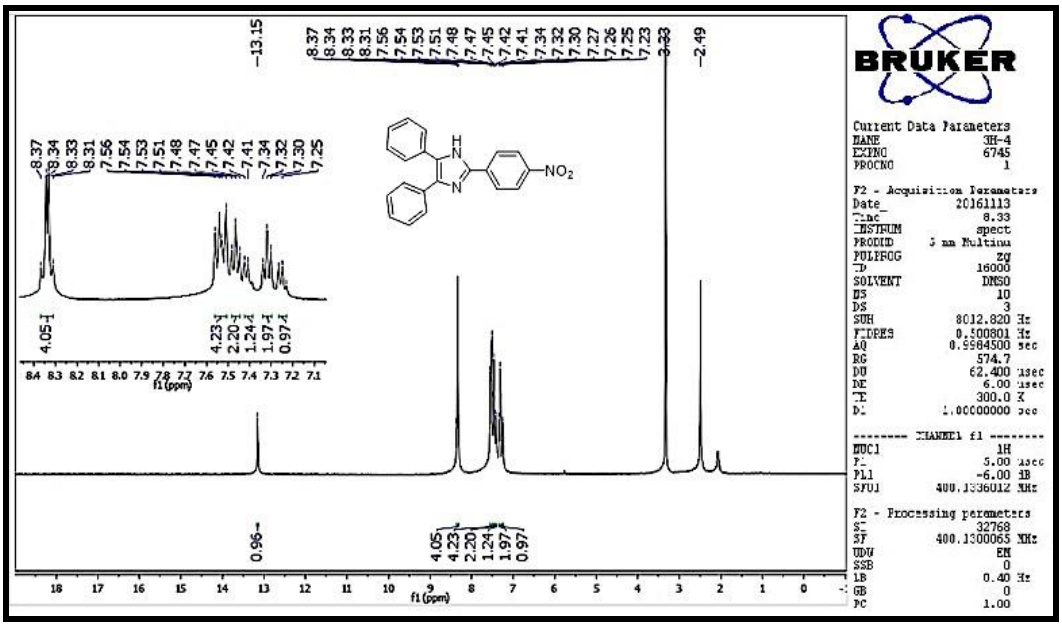

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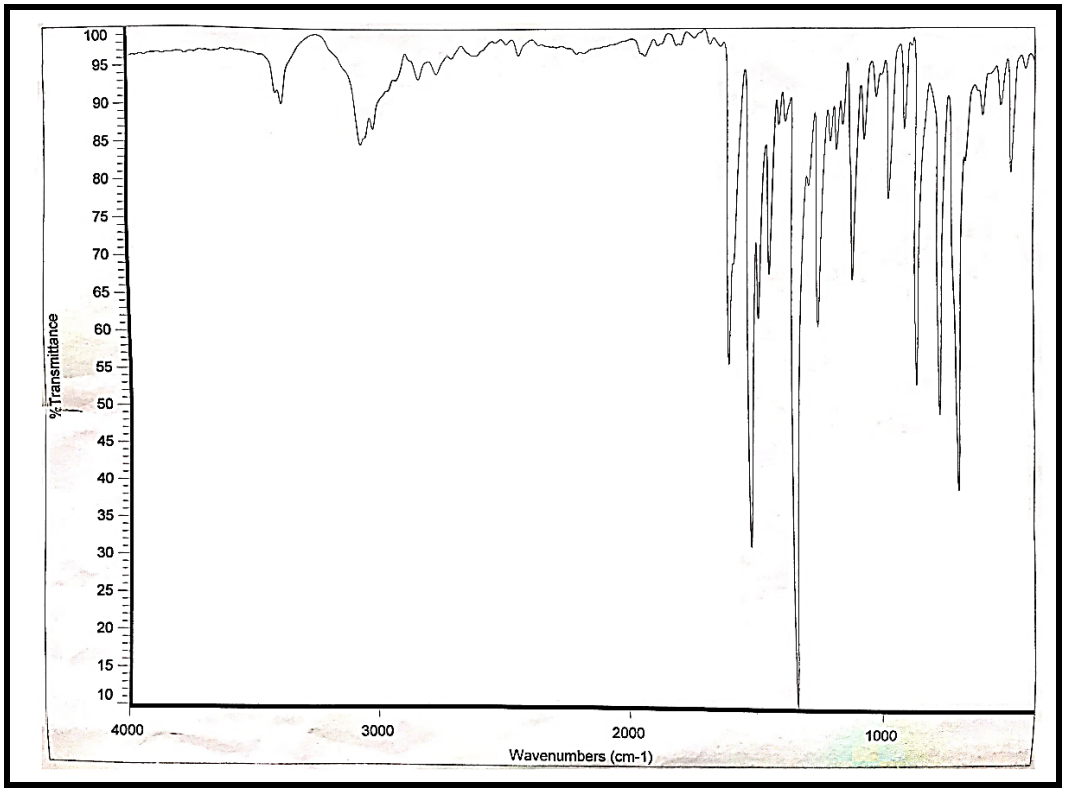

FT-IR of **4l**