

## Supplementary Information

### **Design, preparation and characterization of aerogel NiO-CuO-CoO/SiO<sub>2</sub> nanocomposite as a reusable catalyst for C-N cross-coupling reaction**

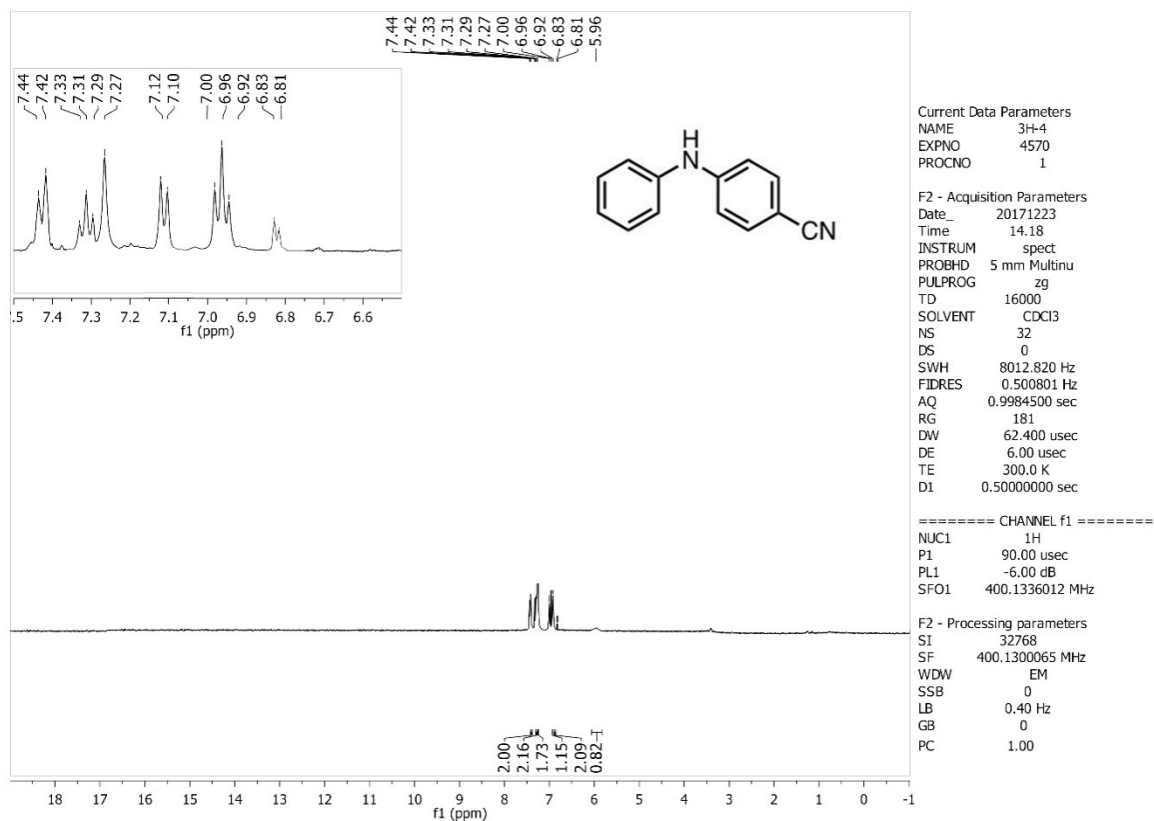
Amir Hossein Ghasemi, Hossein Naeimi\*

*Department of Organic Chemistry, Faculty of Chemistry, University of Kashan, Kashan, 87317-51167, I.R. Iran; Tel: 98-31-55912388; Fax: 983155912397; E-mail: [Naeimi@kashanu.ac.ir](mailto:Naeimi@kashanu.ac.ir)*

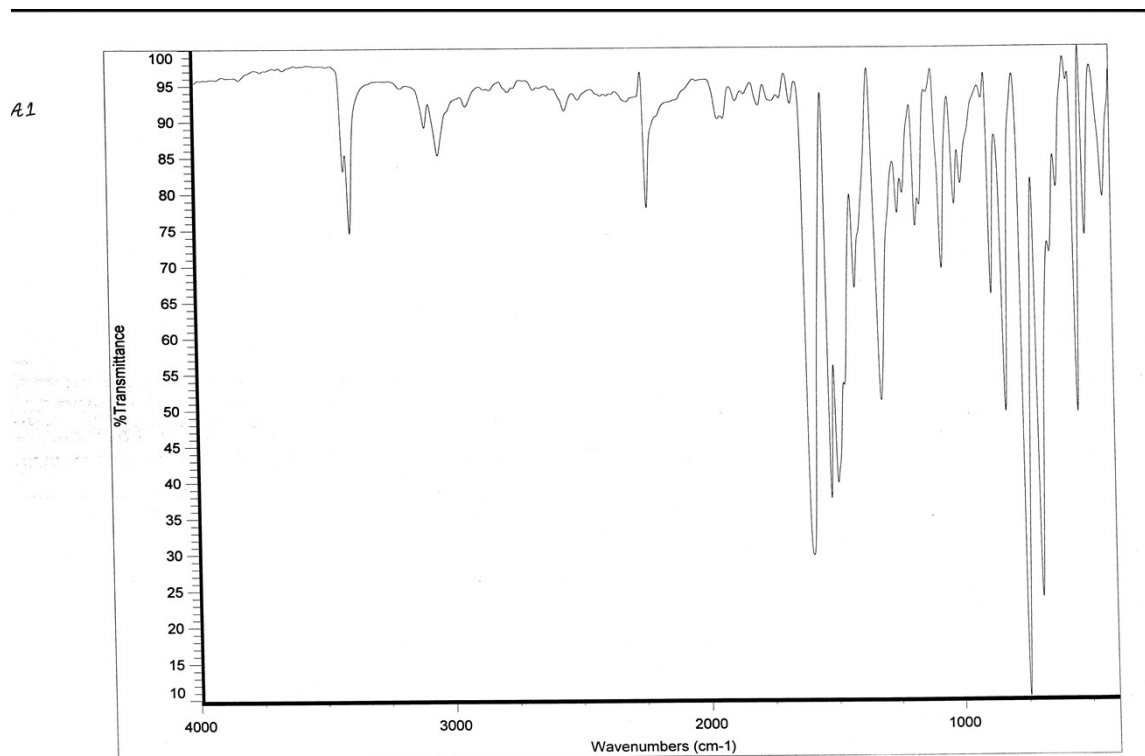
#### **General procedure for the cross-coupling of aniline with aryl halides**

In a round-bottomed flask equipped with a magnetic stirrer, aryl halide (1 mmol), aniline (1.2 mmol), catalyst (3 mg, NiO-CuO-CoO/SiO<sub>2</sub> nanocomposite aerogels) and KOH (3 mmol) were stirred in 5 mL DMF under air atmosphere at 130 °C. The progress of the reaction was monitored by Thin-layer chromatography (TLC). After completion of the reaction, ethyl acetate (15 ml) was added and the catalyst was separated by filtration. The organic layer was washed with water (3 × 10 ml) and dried over anhydrous Na<sub>2</sub>SO<sub>4</sub>. The product was isolated by column chromatography. The recovered catalyst was washed with ethanol and water and dried at 80 °C for further use.

# Electronic Supplementary Material (ESI) for New Journal of Chemistry

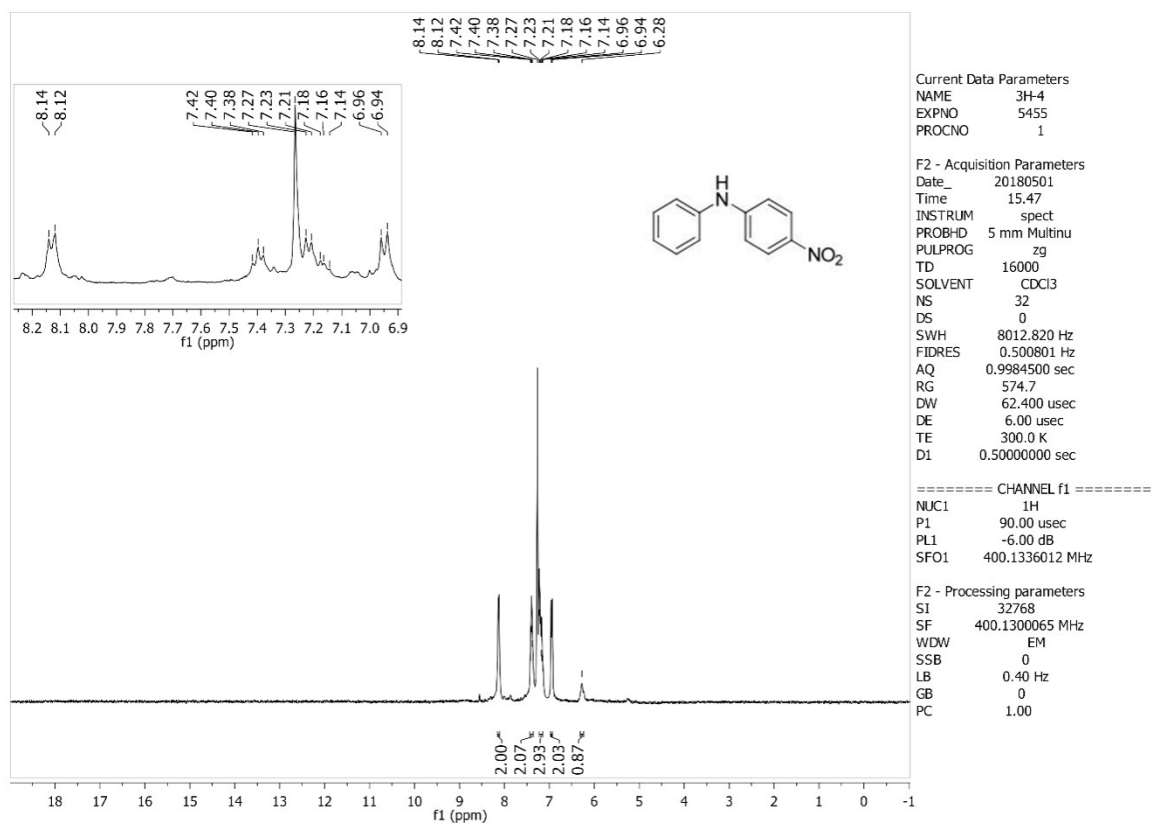


<sup>1</sup>H NMR of 4-(phenylamino) benzonitrile (3a)

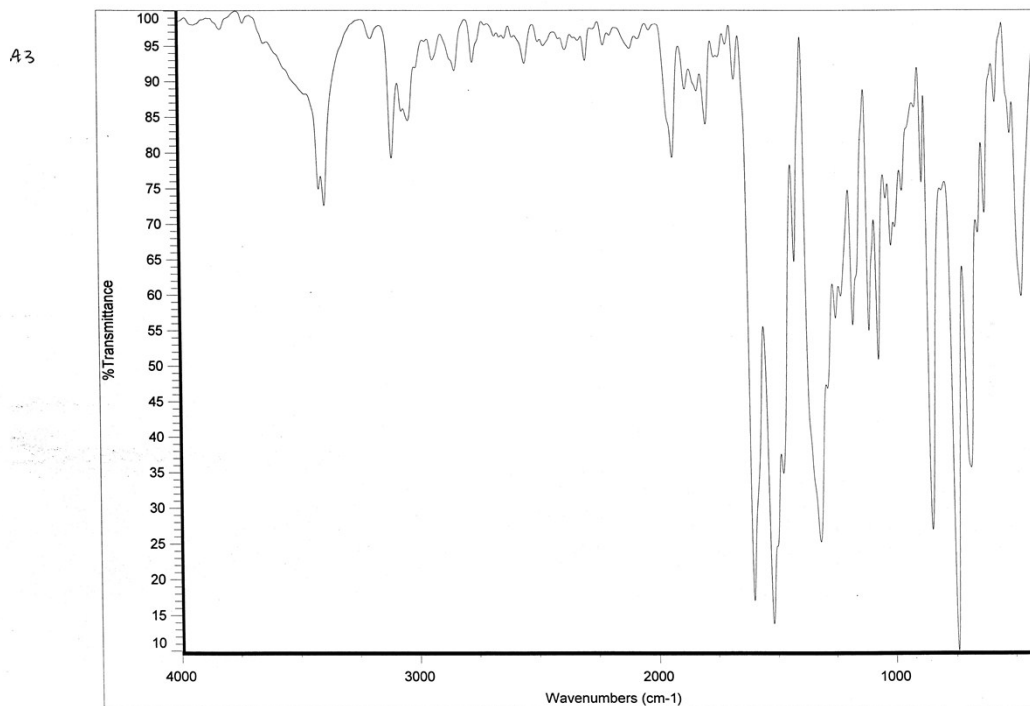


FT-IR of 4-(phenylamino) benzonitrile (3a)

# Electronic Supplementary Material (ESI) for New Journal of Chemistry

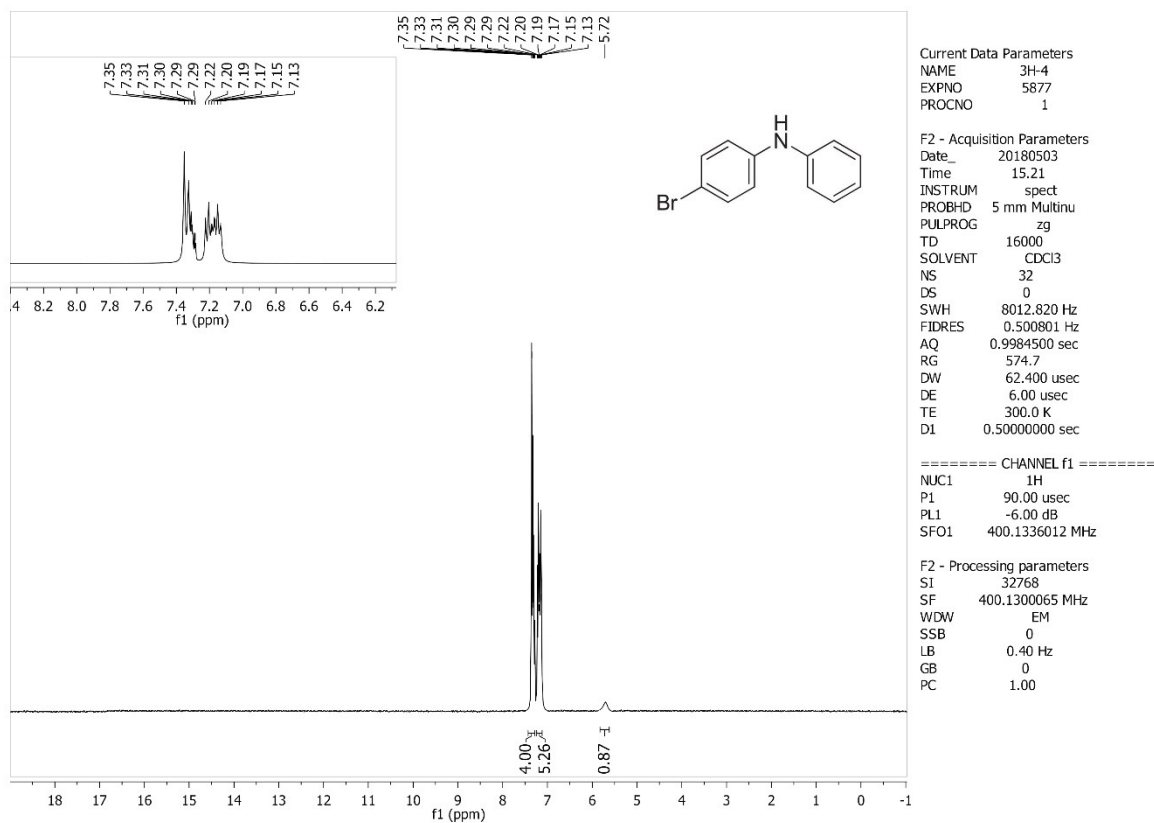


<sup>1</sup>H NMR of 4-nitro-*N*-phenylaniline (3b)

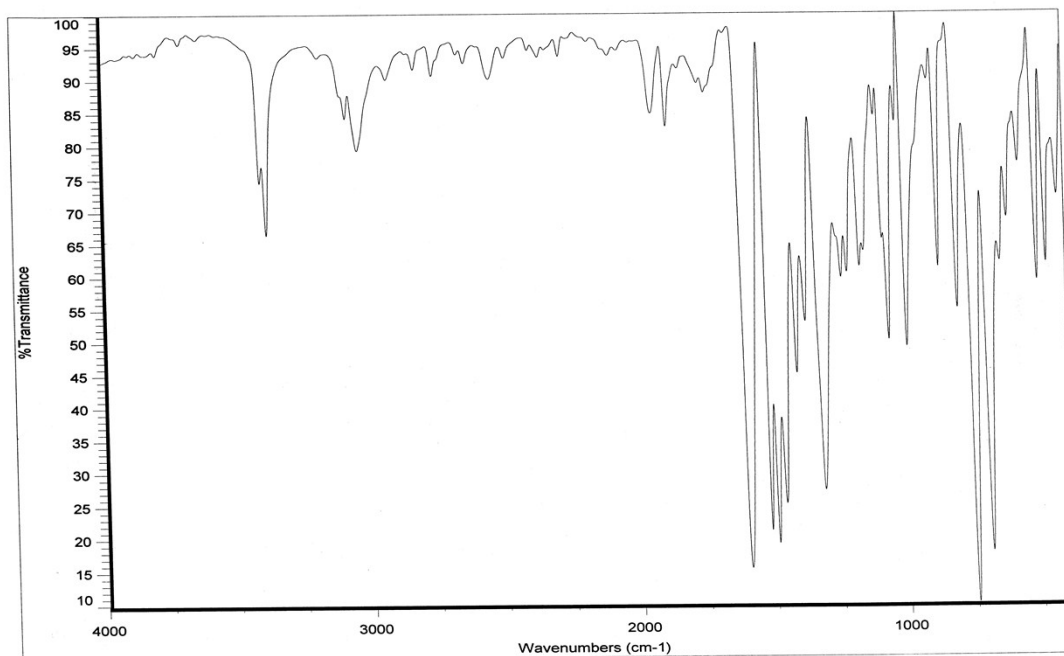


FT-IR of 4-nitro-*N*-phenylaniline (3b)

# Electronic Supplementary Material (ESI) for New Journal of Chemistry

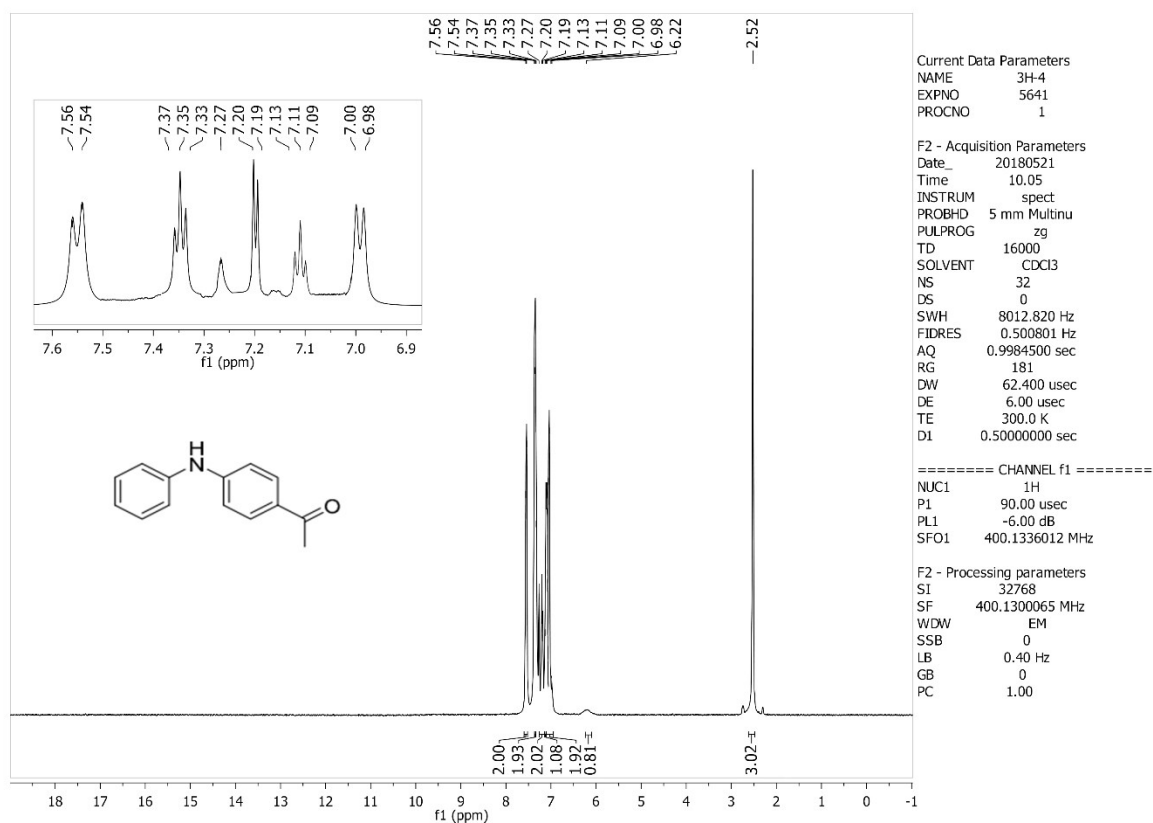


<sup>1</sup>H NMR of 4-bromodiphenylamine (3c)

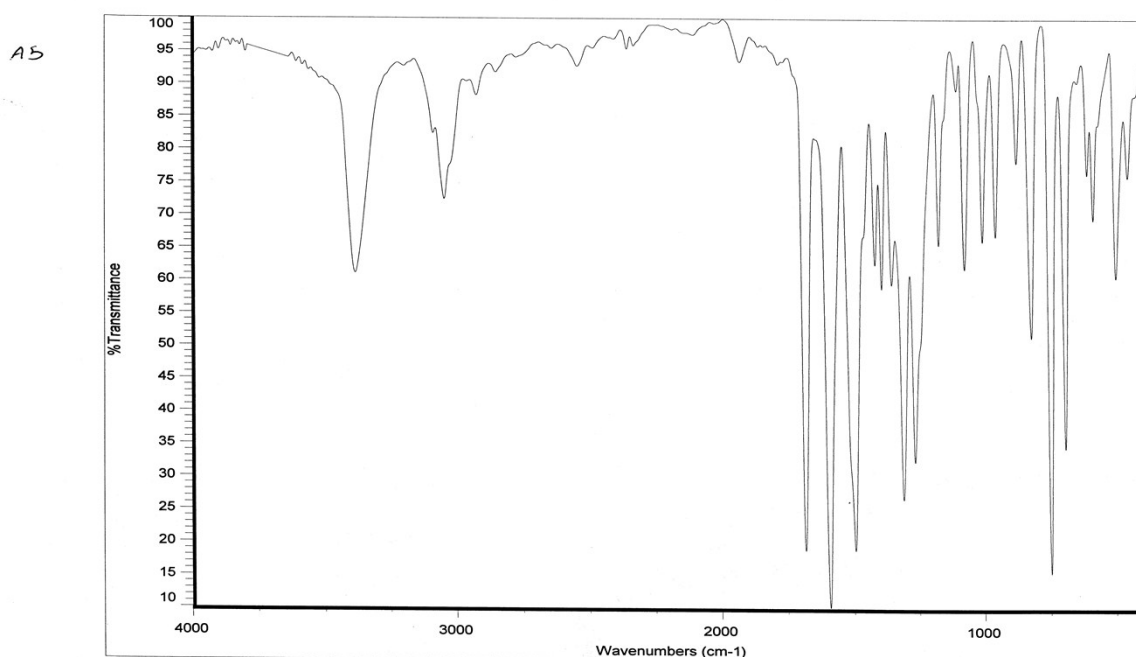


FT-IR of 4-bromodiphenylamine (3c)

# Electronic Supplementary Material (ESI) for New Journal of Chemistry

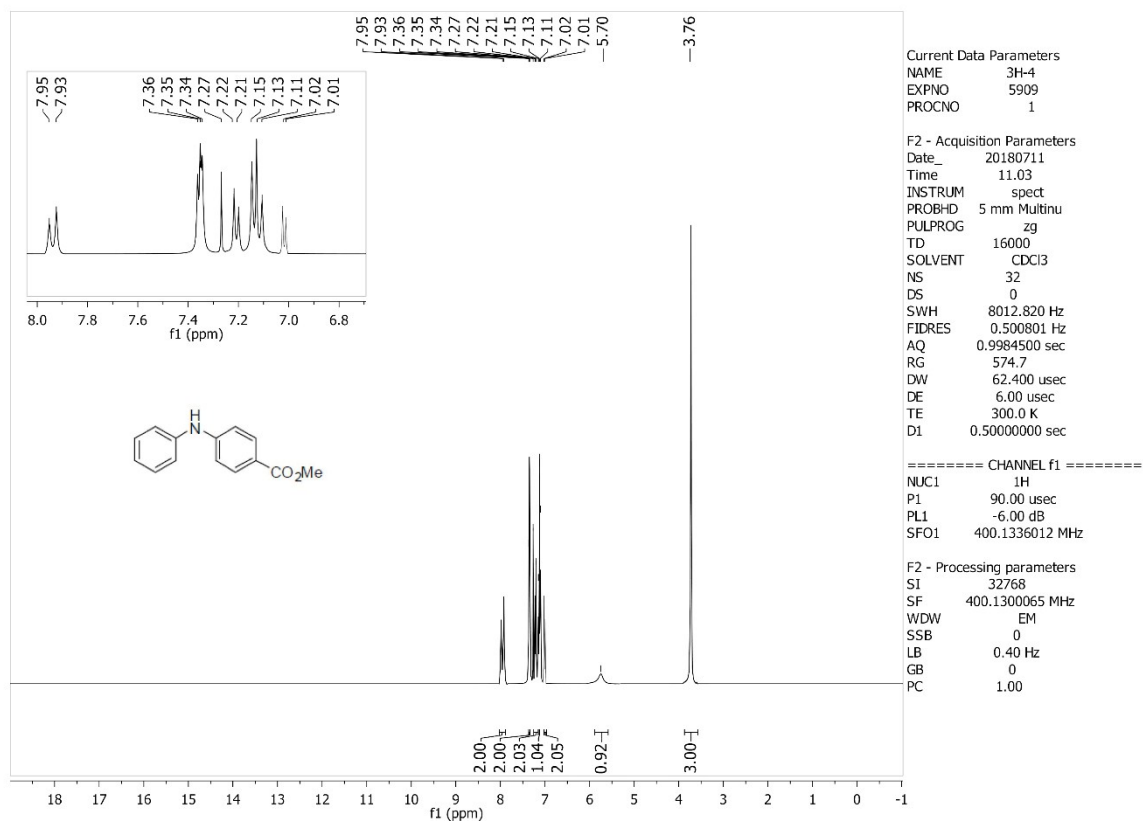


<sup>1</sup>H NMR of 1-(4-(phenylamino) phenyl) ethan-1-one (3d)



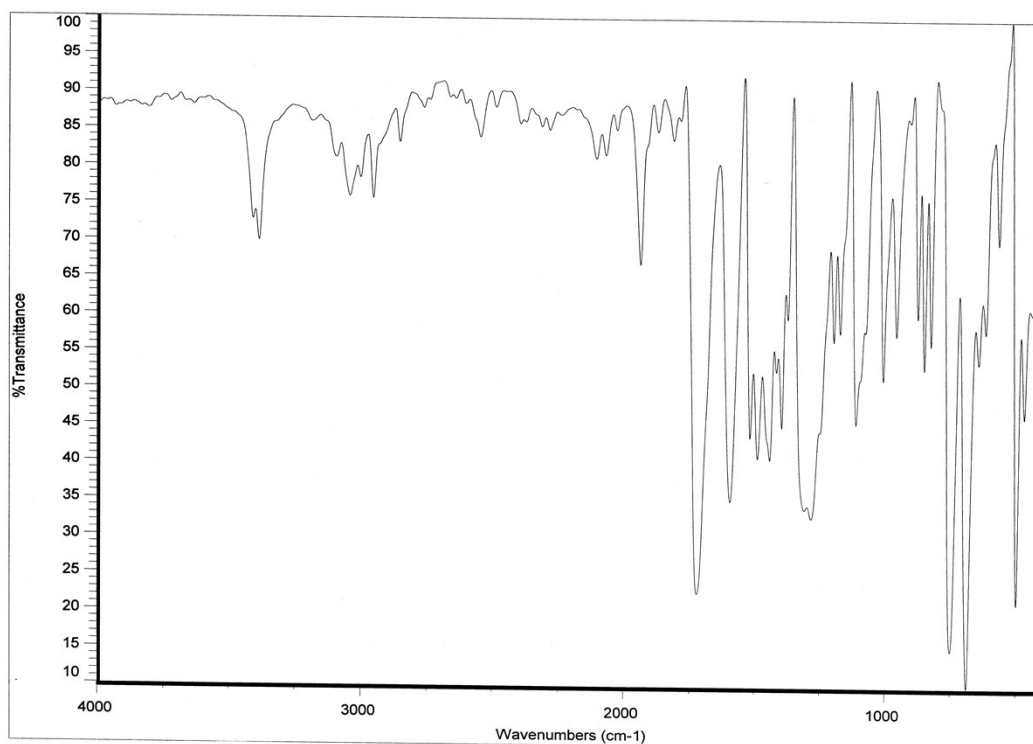
FT-IR of 1-(4-(phenylamino) phenyl) ethan-1-one (3d)

Electronic Supplementary Material (ESI) for New Journal of Chemistry



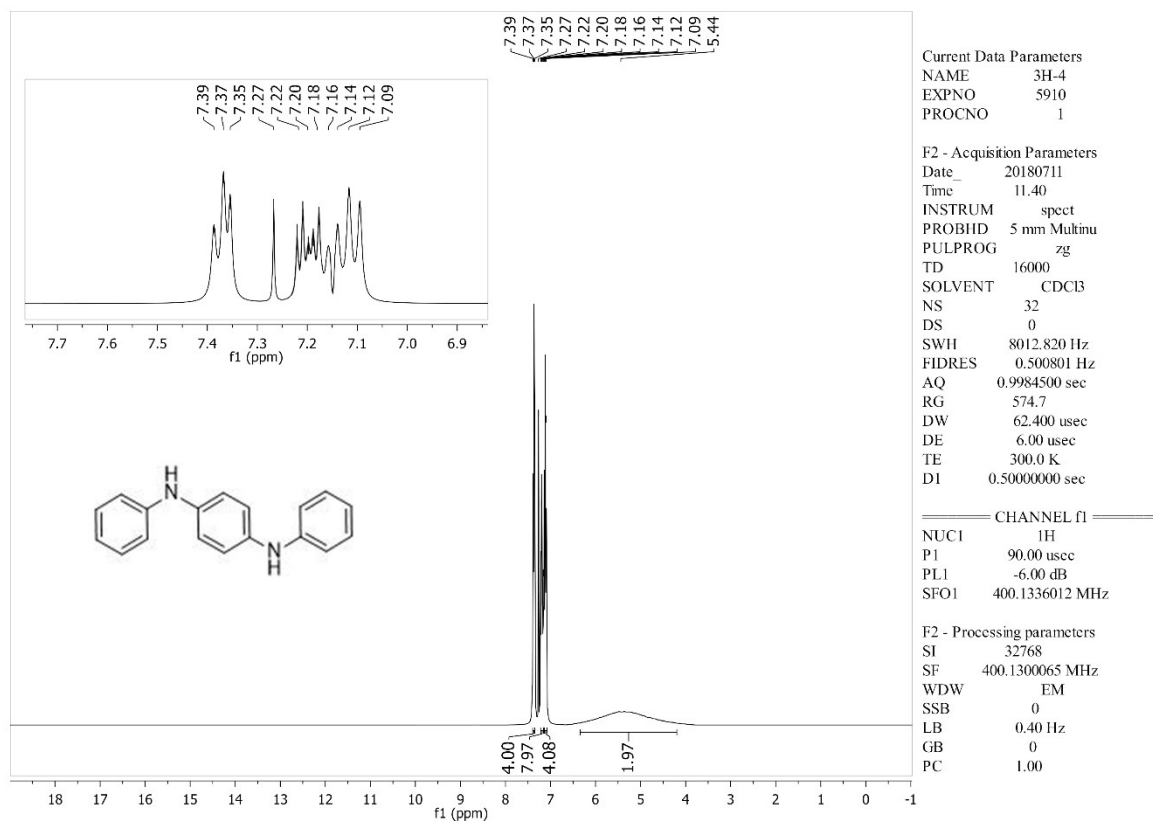
<sup>1</sup>H NMR of methyl 4-(phenylamino) benzoate (3e)

A6

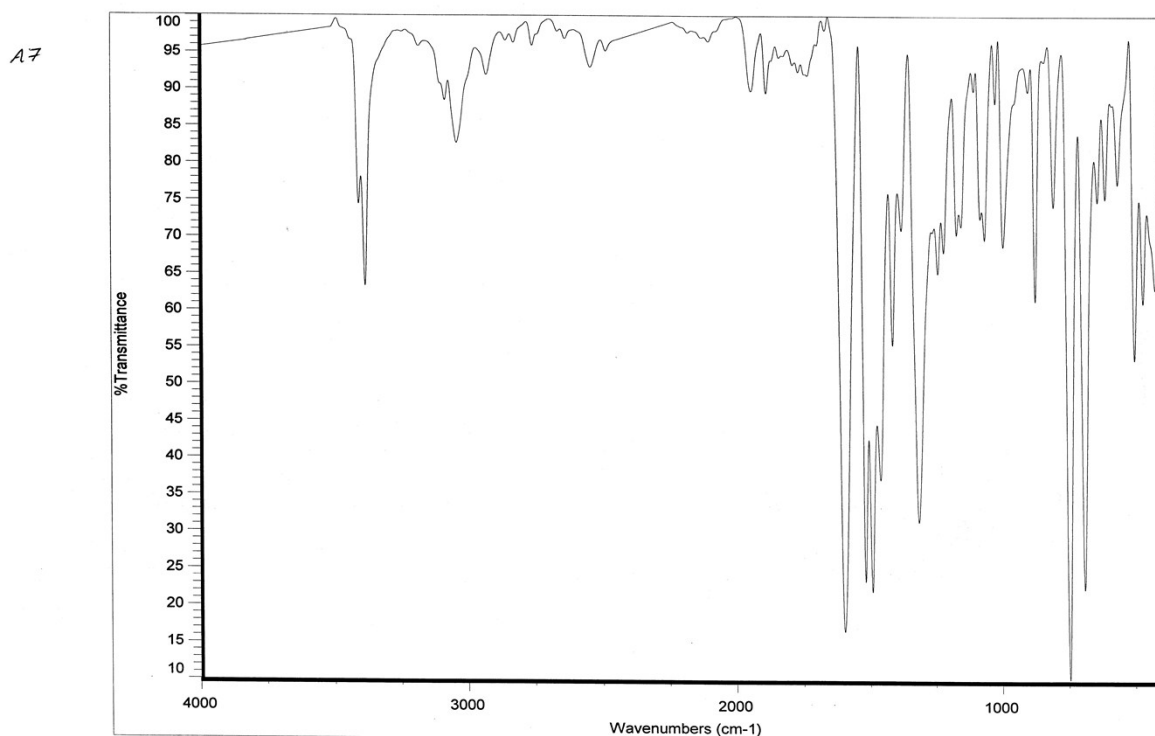


FT-IR of methyl 4-(phenylamino) benzoate (3e)

Electronic Supplementary Material (ESI) for New Journal of Chemistry

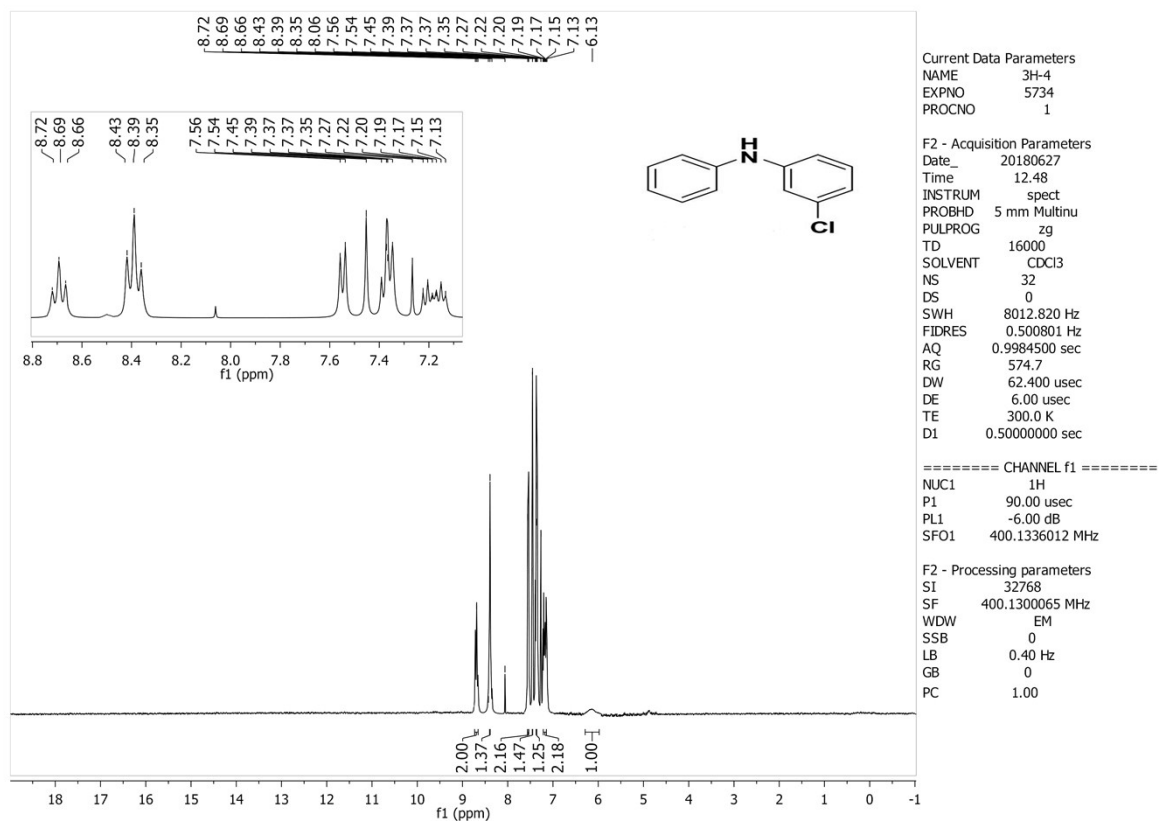


<sup>1</sup>H NMR of N1,N4-Diphenylbenzene-1,4-diamine (3f)

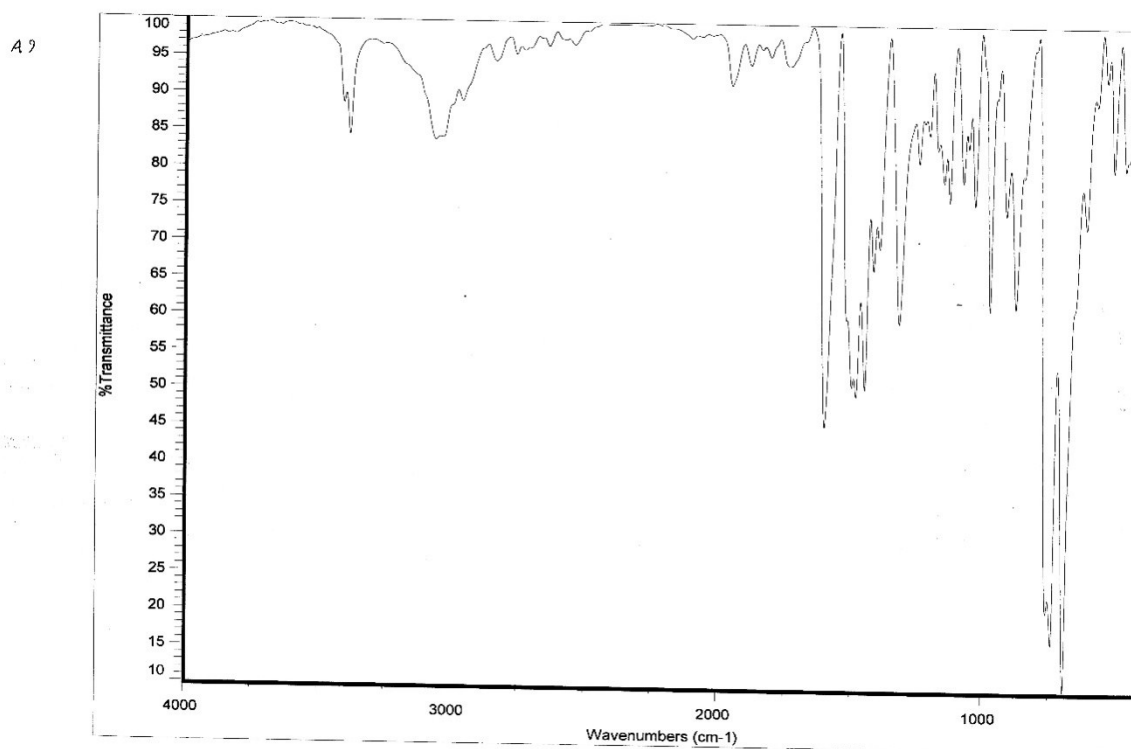


FT-IR of N1,N4-Diphenylbenzene-1,4-diamine (3f)

Electronic Supplementary Material (ESI) for New Journal of Chemistry



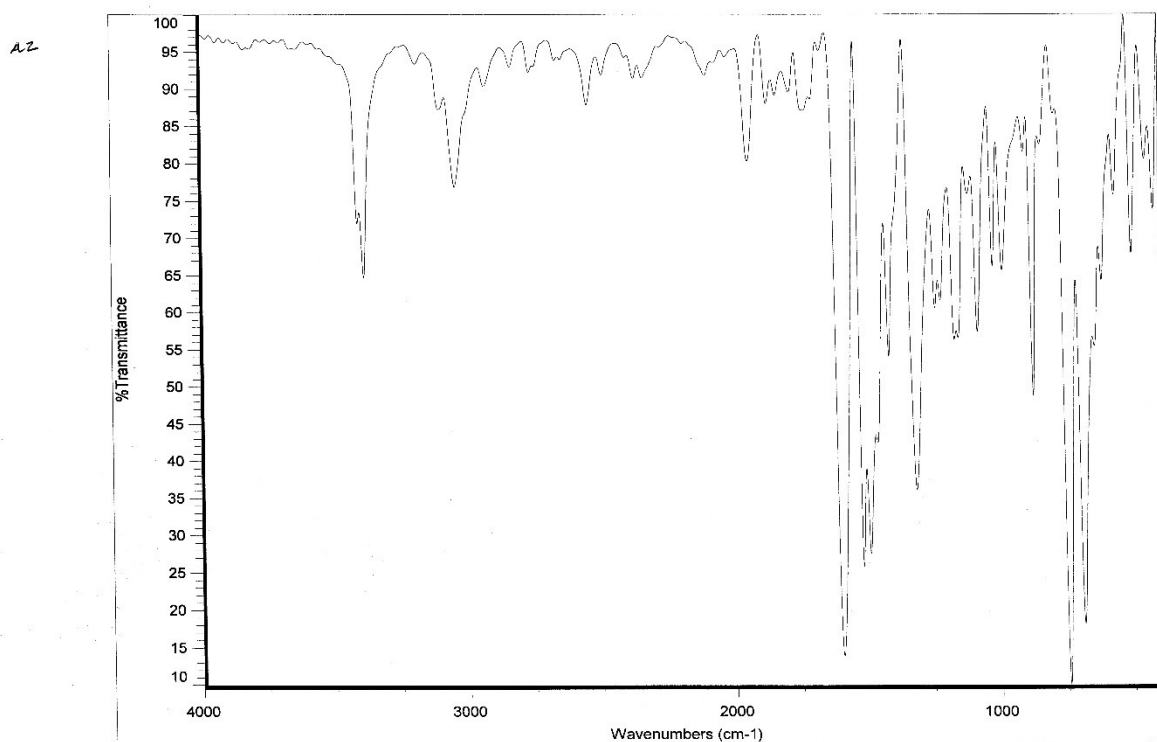
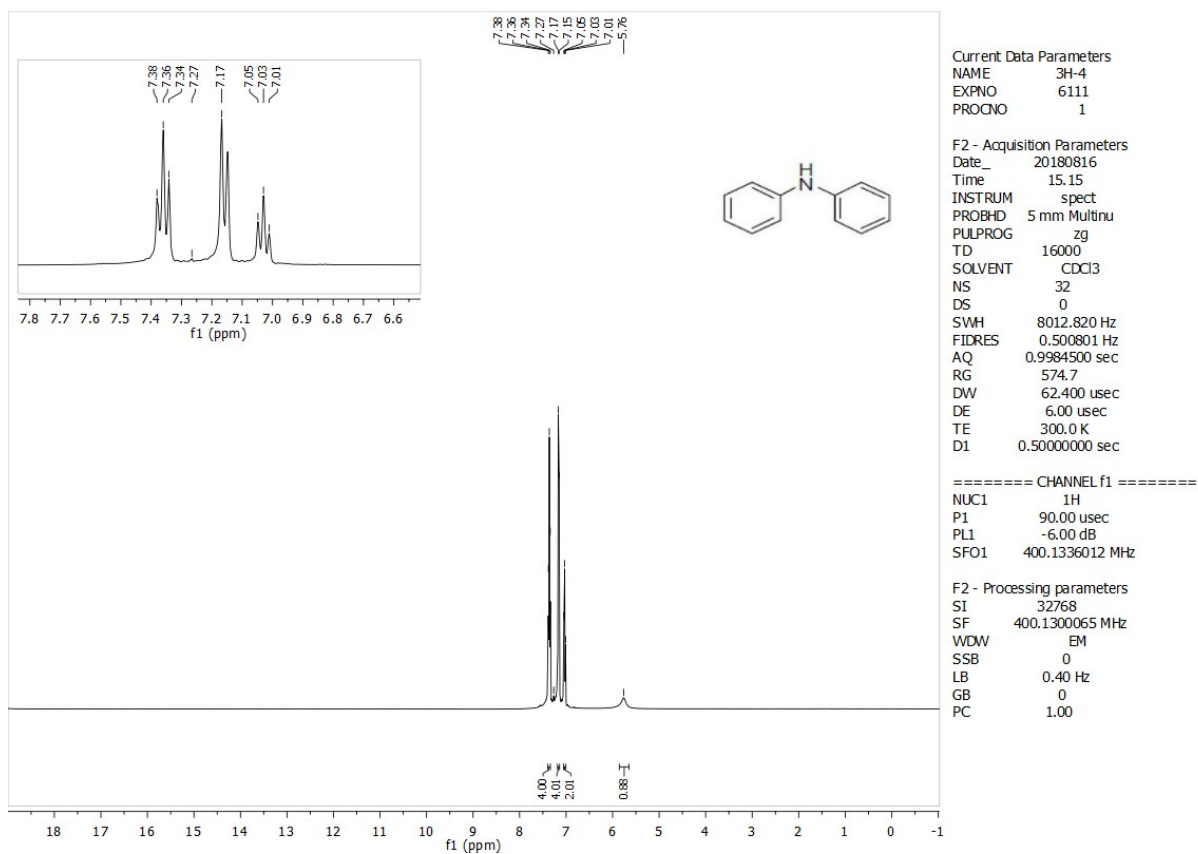
<sup>1</sup>H NMR of 3-Chloro-*N*-phenylaniline (**3g**)



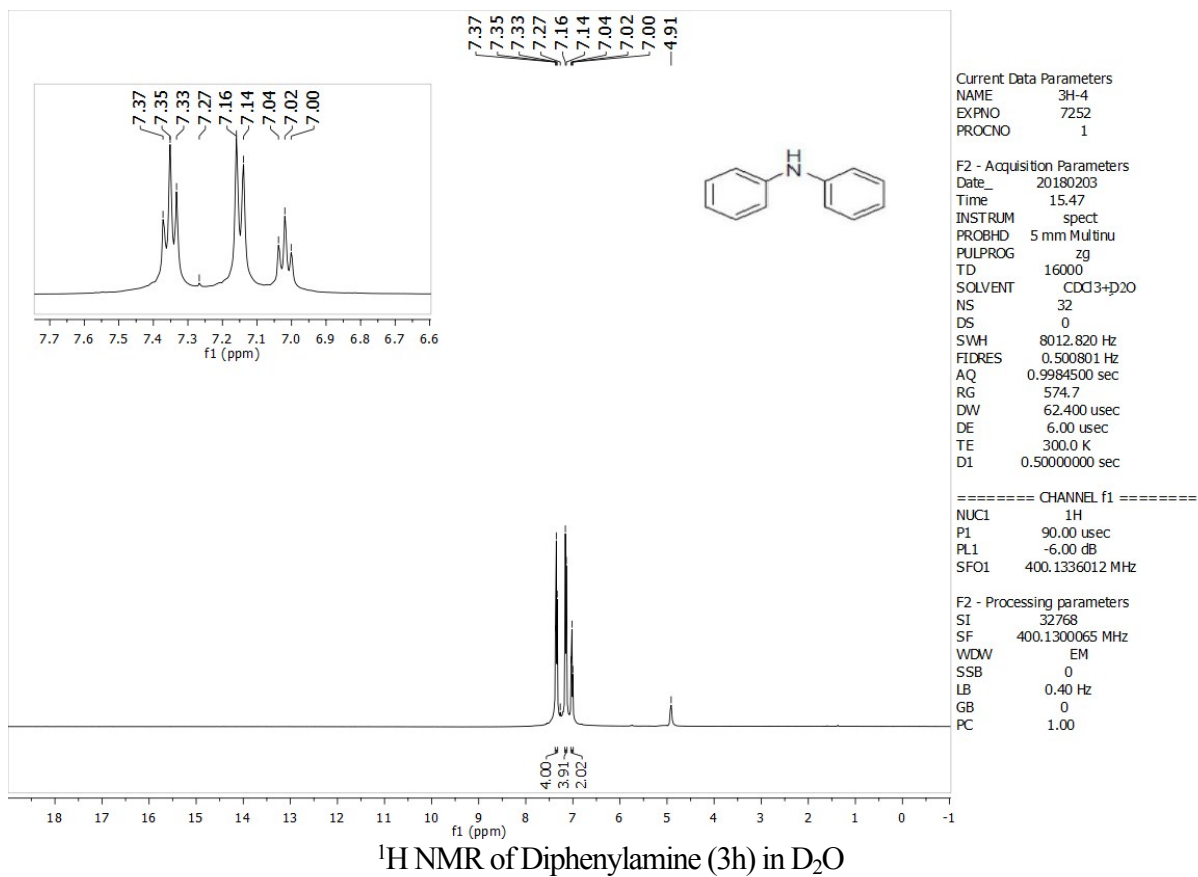
FT-IR of 3-Chloro-*N*-phenylaniline (**3g**)



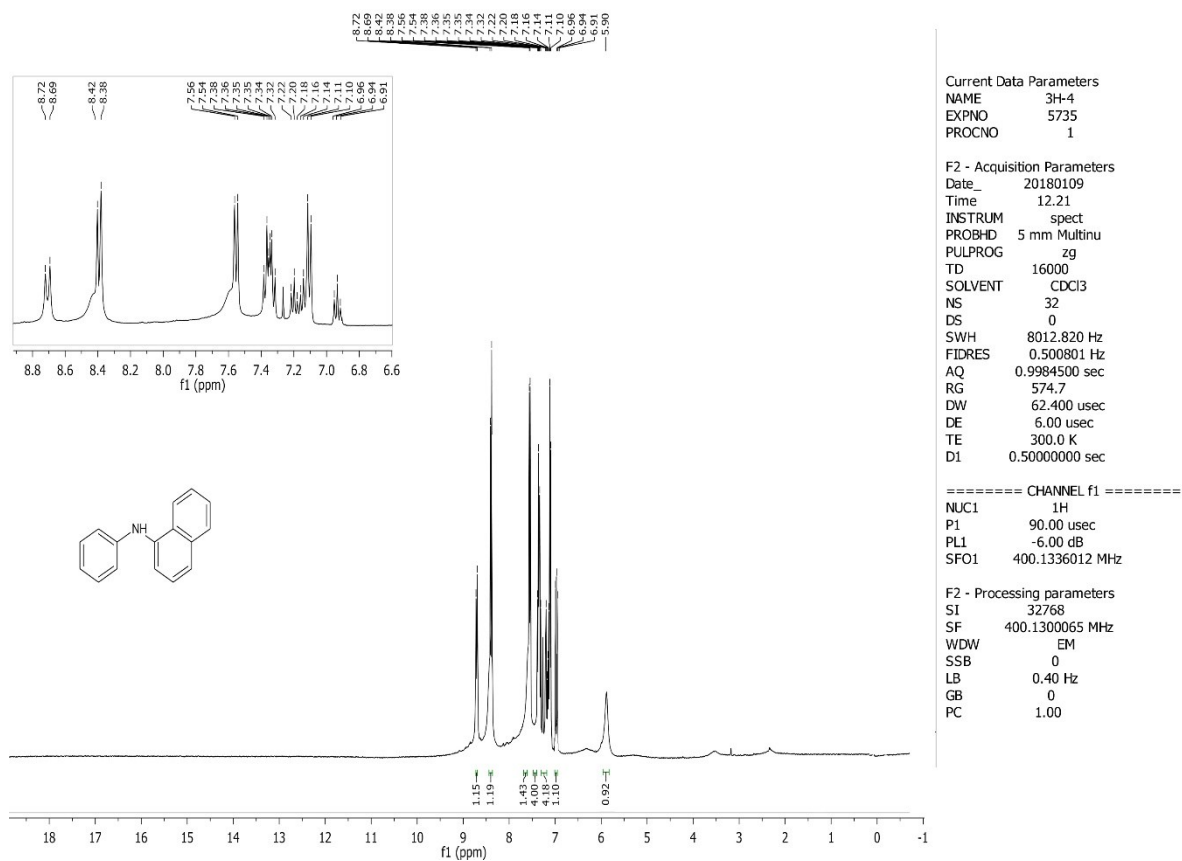
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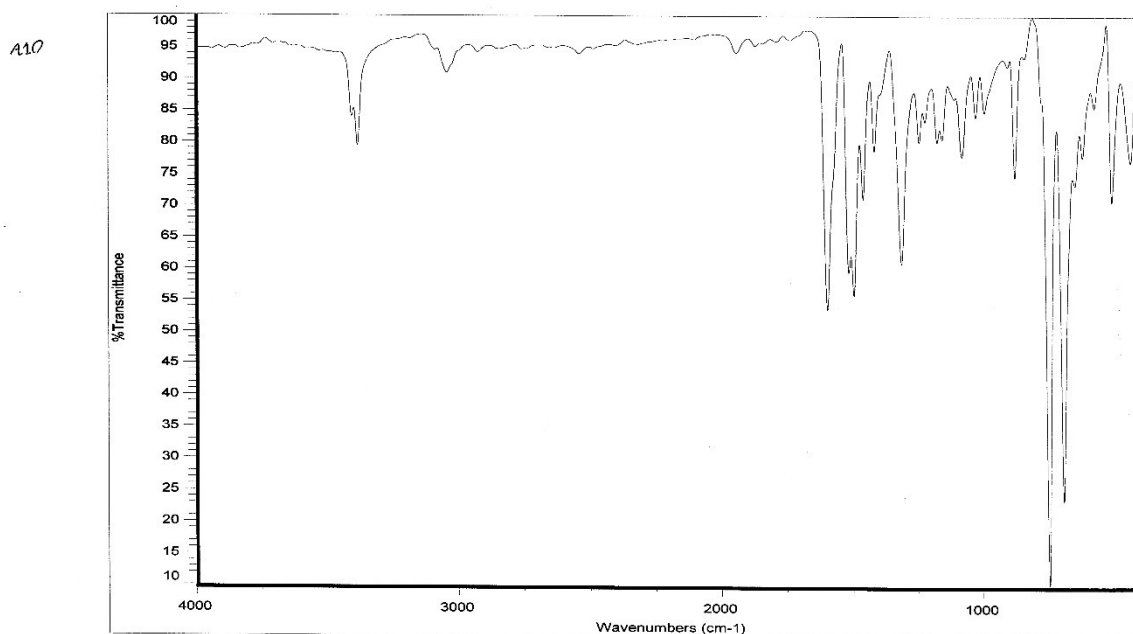
Electronic Supplementary Material (ESI) for New Journal of Chemistry



## Electronic Supplementary Material (ESI) for New Journal of Chemistry

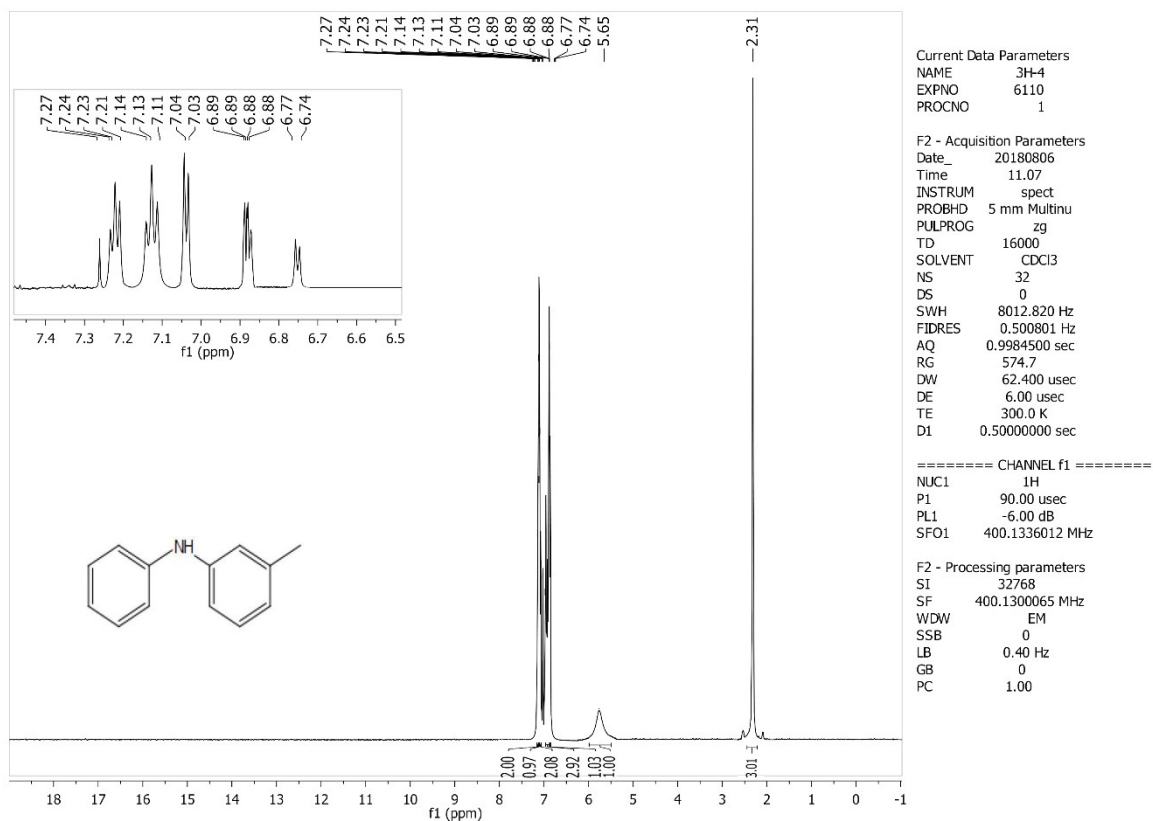


<sup>1</sup>H NMR of *N*-Phenylnaphthalen-1-amine (**3i**)

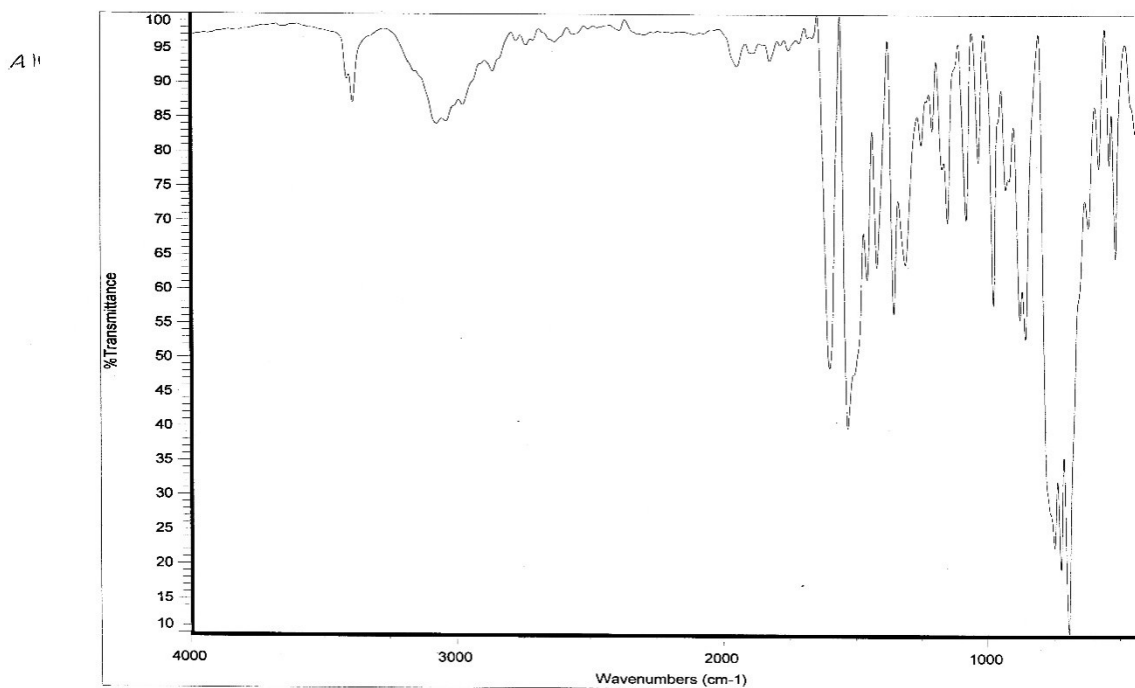


FT-IR of *N*-Phenylnaphthalen-1-amine (**3i**)

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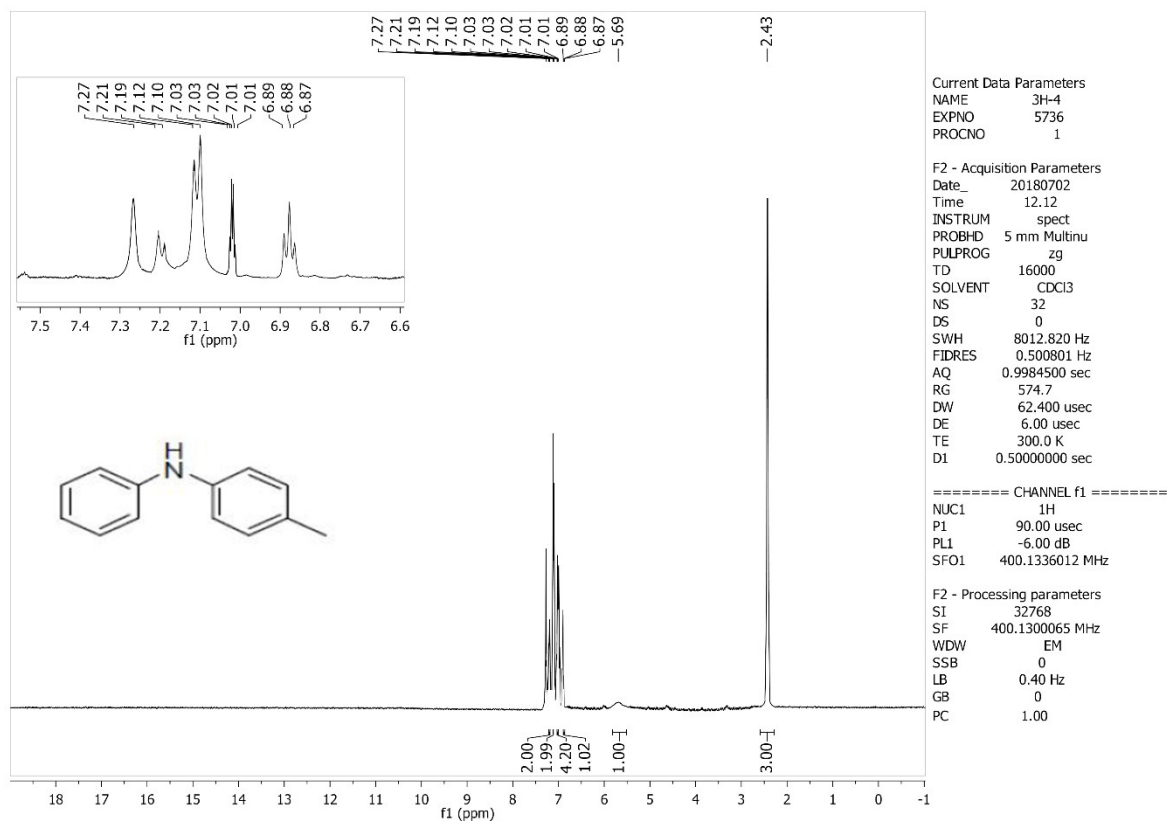


<sup>1</sup>H NMR of 3-Methyl-*N*-phenylaniline (**3j**)



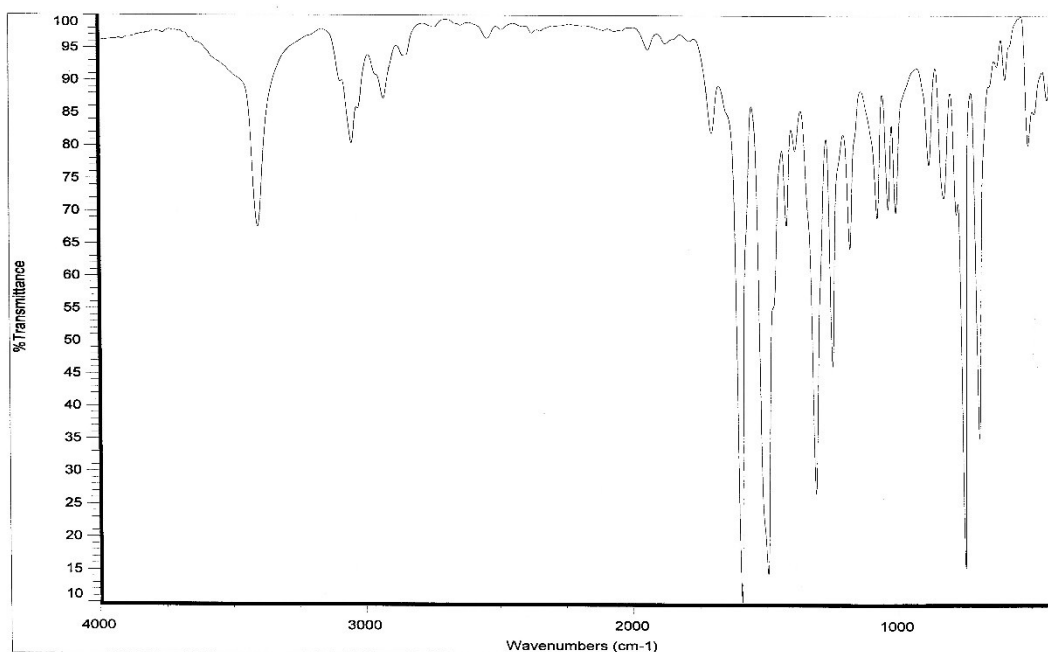
FT-IR of 3-Methyl-*N*-phenylaniline (**3j**)

# Electronic Supplementary Material (ESI) for New Journal of Chemistry



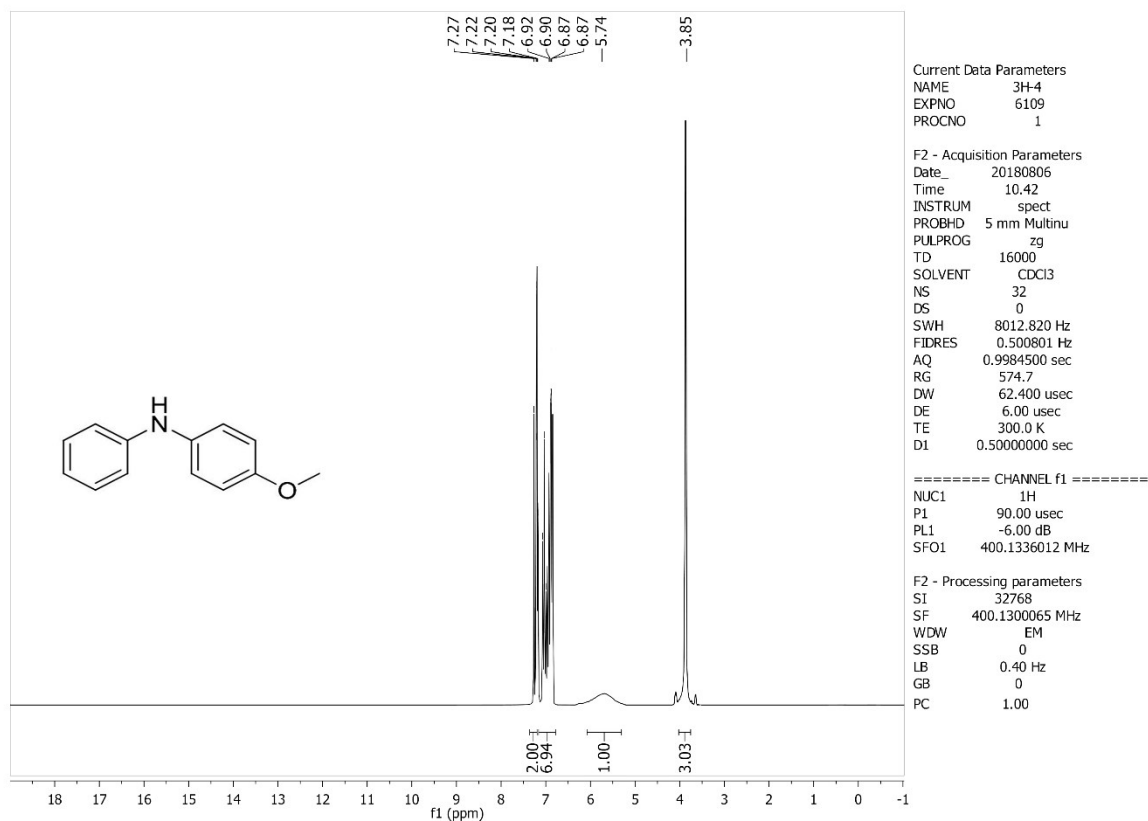
<sup>1</sup>H NMR of 4-Methyl-*N*-phenylaniline (**3k**)

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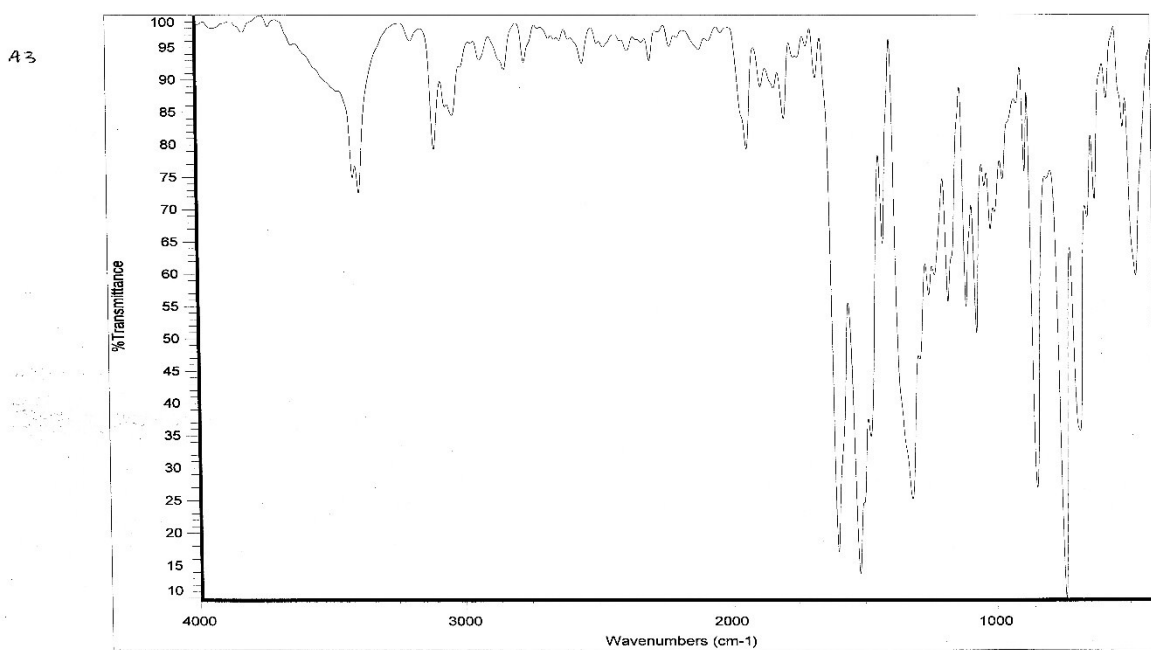


FT-IR of 4-Methyl-*N*-phenylaniline (**3k**)

## Electronic Supplementary Material (ESI) for New Journal of Chemistry



<sup>1</sup>H NMR of 4-Methoxy-*N*-phenylaniline (31)



FT-IR of 4-Methoxy-*N*-phenylaniline (31)