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SYNTHESIS AND SPECTRAL DATA OF NOVEL DERIVATIVES OF PHENOL DERIVATIVES

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Abstract:

The present study provides an overview of the synthesis of 1-((2,4-dihydroxyphenyl)(4-methoxyphenyl)methyl)urea and 1-((2-hydroxy-5-nitrophenyl)(4-methoxyphenyl)methyl)thiourea by condensing urea and thiourea with substituted phenols and substituted aromatic aldehydes. In the end, all compounds synthesized using substituted phenols were characterized using spectral analysis.

Keywords: Spectral analysis, substituted aromatic aldehyde, para anisaldehyde.

Introduction:

The diverse bioactivities associated with phenol derivatives make them development of novel therapeutics [1] and improved material properties, and tailored functionalities [2].In pharmaceuticals, the synthesis of novel urea derivatives holds immense promise for drug development. A review of the literature indicates that substituted phenol derivatives exhibited a wide range of biological activities as antiviral, anti-convulsant, anti-inflammatory, anti-microbial and anti-tumor effects [3-7] according to the authors, a fixed component, and para anisaldehyde, was reacted with amides and phenolics to produce compounds I-IV.

Material and method:

All the reagents and solvents used were of laboratory grade, which were used without further purification. The IR spectra were taken on an FT-IR-Alpha Bruker IR from 4000 cm^{-1} to 400 cm^{-1} IR spectrometer in KBr pellets.

Derivatives of Phenol Synthesized in Series:

Using drops of urea (0.05mol) and thiourea (0.05mol) in ethanol, phenol derivatives (0.05mol) and para anisaldehyde (0.05mol) were added to the mixture, and it was stirred in a hot water bath at 85°C temperature for an hour at a constant temperature. The solid separated on the cooling of the reaction mixture was recrystallized from ethanol.

Detailed Scheme of Synthesis:

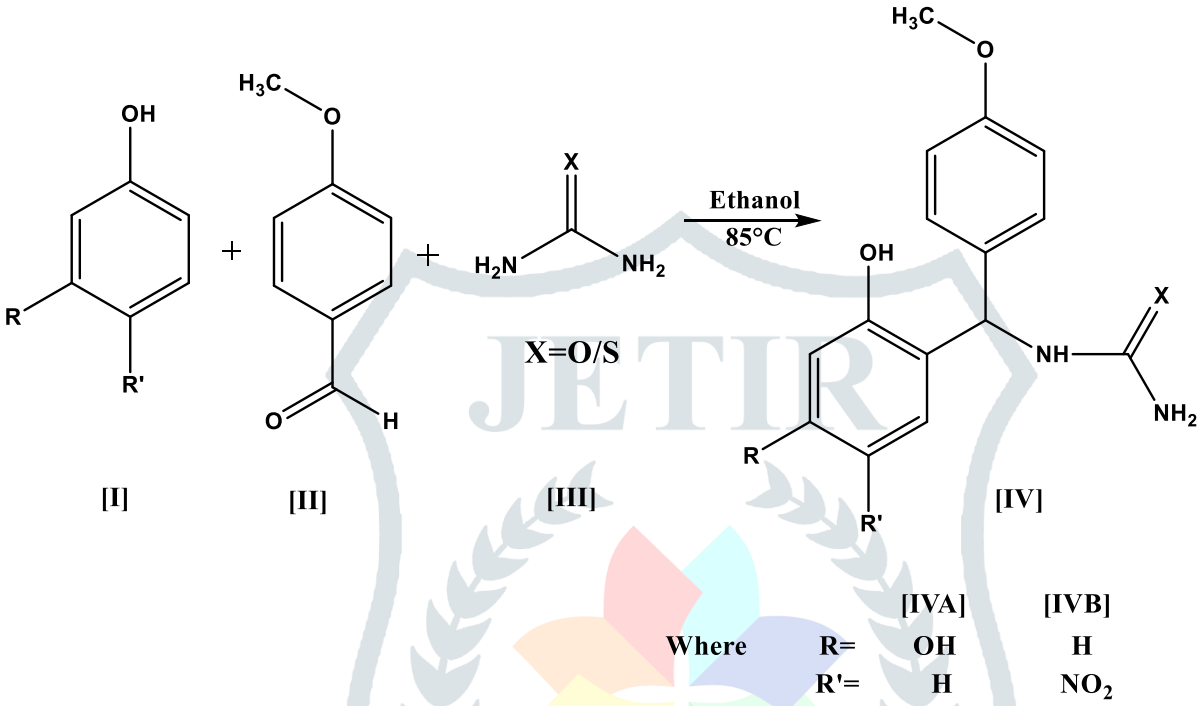

Table-1 Novel synthesized phenol derivatives: Physical data

COMPOUND CODE	MOLECULAR WEIGHT	MOLECULAR FORMULA	YIELD (%)	COLOR
[IVA]	288.30	$C_{15}H_{16}N_2O_4$	58%	Red
[IVB]	333.36	$C_{15}H_{15}N_3O_4S$	53%	Light Green

Result and Discussion:

Compound Code [IVA] 1-((2,4-dihydroxyphenyl)(4-methoxyphenyl)methyl)urea

IR (KBR, V_{max}, cm^{-1}): 3585 (Ar-OH), 3496 (Ar-OH), 3031.56 (NH_2 stretching), 1653 (C=O), 3186 (C-H stretching)

^{1}H NMR (DMSO) δ: 3.81 (s, 3H), 6.89 (d, 2H), 7.21 (d, 2H), 6.16 (d, H), 6.46 (d, NH), 5.45 (s, 2H), 9.68 (s, OH), 6.24 (s, H), 6.94 (d, H), 6.27 (d, H), 8.91 (s, OH)

^{13}C NMR (DMSO) δ: 162.7 (C=O), 157.4 (C-OH), 129.2 (Ar.), 55.8 (OCH_3), 52.6 (CH)

m/z: 288

Compound Code [IVB] 1-((2-hydroxy-5-nitrophenyl)(4-methoxyphenyl)methyl)thiourea

IR (KBR, V_{max}, cm^{-1}): 3610 (Ar-OH), 3108 (NH_2 stretching), 1018 (C=S), 3232 (C-H stretching)

^{1}H NMR (DMSO) δ: 3.81 (s, 3H), 6.89 (d, 2H), 6.89 (d, 2H), 5.19 (d, 1H), 9.85 (d, NH), 9.53 (s, 2H), 11.88 (s, OH), 7.10 (d, H), 8.09 (d, H), 8.05 (s, H)

^{13}C NMR (DMSO) δ: 182.5 (C=S), 164 (C-OH), 129 (Ar), 56.7 (CH), 55.8 (OCH_3)

m/z: 333

CONCLUSION: In the study, we have synthesized substituted phenol derivative compounds using laboratory-grade reagents and solvents. An analysis of spectral data was used to verify the proper synthesis of new substituted phenol derivatives.

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