



SYNTHESIS OF SOME NOVEL CHALCONES DERIVED FROM P-CRESOL AND AROMATIC ALDEHYDES

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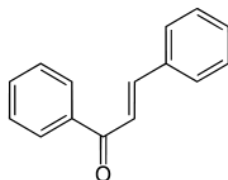
ABSTRACT

Chalcones are biologically active compounds belongs to flavonoids family. This paper describes the synthesis of some chalcones from 2-hydroxy -5-methyl acetophenone. The synthesis was based on stirring 2-hydroxy -5-methyl acetophenone with aromatic aldehydes. The entire chalcone compounds were confirmed by melting point and FT-IR spectroscopy.

KEYWORDS: Aromatic aldehydes, 2-hydroxy-5-methylacetophenone, chalcones, FT-IR spectra.

INTRODUCTION

Chalcones are α,β -unsaturated ketones which is an important class of naturally occurring flavonoids.^[1] Chalcones are the precursor for the synthesis of flavonoids and isoflavonoids which are present in natural compounds.^[2] Structure of chalcone containing two aromatic benzene rings which are linked by an aliphatic three carbon atoms chain as shown below.^[3]



Naturally chalcones are distributed in vegetables, fruits, tea and spices. The synthetic chalcones can be synthesized by condensation of acetophenone and aromatic aldehydes.^[4] Chalcones are biological active compounds having various biological activities such as anticancer⁵, cytotoxic, antioxidant,^[6] anti-inflammatory, antiviral, antimalarial, antimicrobial, antitumor, anticonvulsant, antifungal, antipyretic and antidepressant.^[7-11]

In the present study three novel chalcones were synthesized by condensation of 2-hydroxy -5-methyl acetophenone with aromatic aldehydes (3,4-dimethoxybenzaldehyde, p-chlorobenzaldehyde and 2-nitrobenzaldehyde).

METHODS AND MATERIALS

Synthesis of 2-hydroxy-5-methyl acetophenone (I)

p-cresyl acetate was obtained from p-cresol by acetylation. Then p-cresyl acetate was mixed with anhydrous $AlCl_3$ and heated at $120^\circ C$ for 45min in oil bath to obtained 2-hydroxy-5-methyl acetophenone (I). **m.p. $56^\circ C$.**

Synthesis of Chalcones (3a-3c)

Compound (1) (0.01mol) was added separately to aromatic aldehydes (2a, 2b and 2c) (0.01mol). The reaction mixture was stirred for 2 hours and kept overnight at room temperature. Then it was poured in crushed ice and then acidified with dilute HCl. The crude precipitate obtained, washed, filtered and re-crystallized from ethanol.

RESULT AND DISCUSSION

The synthesized chalcones were characterized by IR spectra.

3-(3,4-dimethoxyphenyl)-1-(2-hydroxy-5-methylphenyl)-prop-2-ene-1-one (3a).

IR (KBr) cm^{-1} : This compound displays following signals, $2927.34cm^{-1}$ (Ar-C-H-Str.), $3400cm^{-1}$ (-OH-Str.), $1635.64cm^{-1}$ (-C=O-Str.), $1560.41cm^{-1}$ (-C=C-Str.), $561.29, 466.77cm^{-1}$ (-Ar-C-H-Bending.), $1186.22, 1263.37cm^{-1}$ (-C-O-Str.), $2843.07cm^{-1}$ (-O-CH₃-Str.).

3-(4-chlorophenyl)-1-(2-hydroxy-5-methylphenyl)-prop-2-ene-1-one (3b).

IR (KBr) cm^{-1} : The signals appeared at, $2918cm^{-1}$ (Ar-C-H-Str.), $3400cm^{-1}$ (-OH-Str.), $1645.28cm^{-1}$ (-C=O-Str.), $1573.91cm^{-1}$ (-C=C-Str.), $806.25cm^{-1}$ (-Ar-C-H-Bending.), $700cm^{-1}$ (-C-Cl-Str.).

3-(2-nitrophenyl)-1-(2-hydroxy-5-methylphenyl)-prop-2-ene-1-one (3c).

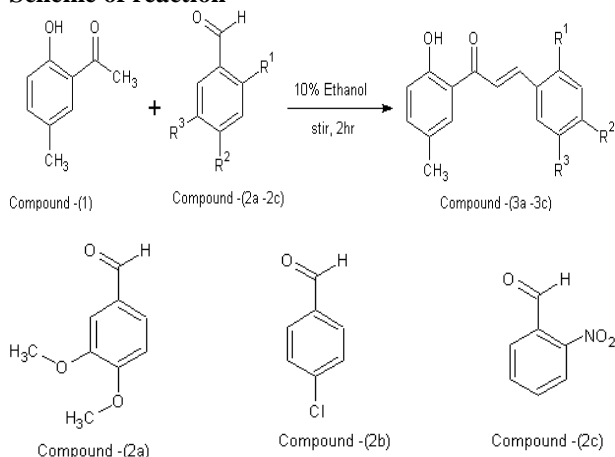
IR (KBr)cm⁻¹: The signals appeared at,2918 cm⁻¹(Ar-C-H-Str.),3115.04cm⁻¹(-OH-Str.),1612cm⁻¹ (-C=O-Str.), 1560.41cm⁻¹(-C=C-Str.),894,808,750,680cm⁻¹(-Ar-C-H-Bending.),1288,1230,1130cm⁻¹ (-C-O-Str.),1487.12 cm⁻¹(-NO₂-Str.).

The stretching frequency of ketone functional group should observed in the region of (1715-1725cm⁻¹) but observed in the region of (1612-1645-28cm⁻¹) which may be attributed due to the presence of conjugation in the synthesized chalcones. The melting points of the chalcones (3a-3c) were shown in table no-1.

Table 1: Substituents and melting points.

Compound	R ¹	R ²	R ³	M.P. (°C)
3a	-H	-OCH ₃	-OCH ₃	140
3b	-H	-Cl	-H	142
3c	-NO ₂	-H	-H	164

Scheme of reaction



CONCLUSION

The synthesis of chalcones are based on 2-hydroxy-5-methyl acetophenone as an intermediate was undertaken. The synthesized compounds shown good agreement with the FT-IR data. The synthesized chalcones may have future scope for synthesis of novel compounds like isoxazoline, pyrazoline etc.

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