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# One-Pot Synthesis of 1,8-Dioxo-octahydroxanthene Derivatives

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**ABSTRACT**

An efficient, simple and one-pot protocol for synthesis of 1,8-Dioxo-octahydroxanthene derivatives via multi-component reactions between dimedone and various aromatic aldehydes employing barium perchlorate as catalyst is described. The structural features of the synthesized compounds were characterized by IR and 1H NMR. The presented method is available, environmentally friendly, cheap and highly effective to give the products in good to excellent yields.

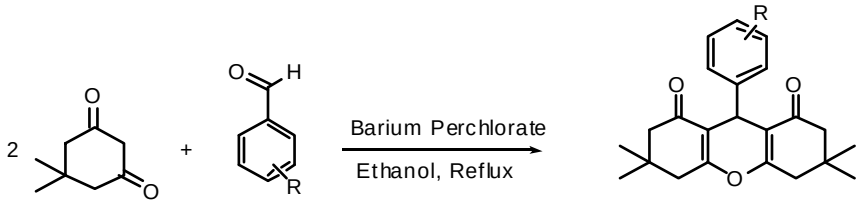
**Key words:** Xanthenes, Solvent-free, Multicomponent reactions, One-pot.

## INTRODUCTION

In recent years, the uses of catalysts supported on solid supports have been extensively developed because such catalysts not only cause to simplify the purification processes but also do not release toxic substances residues into the environment. Although some of them are sensitive to moisture and can be easily decomposed, application of them in organic reactions is difficult. This problem can be solved by fixed onto solid supports[1-3].

Xanthene derivatives are one of the important classes of organic compounds and there are many applications which are biologically important drug intermediates in the field of medicinal chemistry for their biologically active properties, such as antinociceptive activities as well as their efficiency in photodynamic therapy antimalarial, antibacterial, antiinflammatory, and antiviral properties and have been used as dyes, fluorescent material and in laser technologies[6-12]. Recently, several improved methodologies have been developed that use HClO4–SiO2 [13], ZnO [14] triethylbenzyl phosphomolybdic acid supported on silica gel[15], sulfonic acid on silica gel[16], ammonium chloride[17], *p*-dodecyl benzenesulfonic acid[18], and $Zn(NO_3)_2$[19] among others. Previously, we have synthesized a number of heterocyclic compounds[20-30].

In this study, we have used of perchlorate as a catalysts to develop a new and easy methodology for the synthesis of xanthene derivatives. The experiments were started with the study of one pot reaction, available time reaction with high yields, easy separation of product, and a 3-component method, mild and efficient method for the preparation of the xanthenes (Scheme1).




**Scheme1**

## EXPERIMENTAL

All chemicals were obtained from Merck or Fluka without further purification. Silica gel SILG/UV 254 plates were used for TLC. IR spectra were measured on a Shimadzu IR-470 Spectrophotometer. $^1$H NMR spectra were determined on Bruker 400 DRX AVANCE instrument at 400 MHz, respectively.

### General procedure for preparation of N1

A mixture of benzaldehyde (1 mmol), dimedone (2 mmol), barium perchlorate (15 mol %) as a catalyst with 10 ml ethanol as a solvent was refluxed at 3 hours. The progress of reaction was monitored by TLC. After finishing, recrystallized from ethanol 95% to give pure products (**N1**)

### spectral data for N1

White Crystals, Yield: (91%), m.p 200-204 °C.
FT-IR (Vmax/cm-1) (KBr disc): 3000 (CH arom. Str.); 2940 (CH aliph Str.); 1600 (C=O Str.); 1500 (C=C Str.).
$^1$H NMR (400 MHz $CDCl_3$) $\delta$ (ppm) = 1.14 (6H, s, $2CH_3$); 1.28 (6H, s, $2CH_3$); 2.38-2.51 (8H, m, $4CH_2$); 5.55 (2H, s, CH), 7.18-7.35 (5H, m, CH arom).

## RESULTS AND DISCUSSION

We have been able to introduce an efficient and environmentally friendly for the synthesis of xanthene derivatives via condensation of dimedone with various aromatic aldehydes. Therefore, reported new catalyst which could provide an efficient, cheap, easy separation, high yield and simple route under solvent-free condition for the synthesis of 1,8-Dioxo-octahydroxanthenes.

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