



ANTIOXIDANT ACTIVITY OF GREENLY SYNTHESIZED PHOTOCHROMIC FULGIDES

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ABSTRACT

One pot synthesis of acid esters by Stobbe condensation of alkylidene / arylidene succinates and aldehydes or ketones, their subsequent hydrolysis to diacids have reported. The Stobbe condensation of various aromatic aldehydes or ketones with dimethyl succinate gives different types of diacids which on further cyclisation with Hexamethylenetetramine gives Fulgides[3a,(E)-3-benzylidene-4-(diphenylmethylene)dihydrofuran-2,5-dione],[3b, (3Z,4E)-3-(hexan-3-ylidene)-4-(1-phenylethylidene)dihydrofuran-2,5-dione], through green approach. The improved yields of Fulgenic acid have observed by the green approach as compared with other classical methods employed so far. The antioxidant activity of anhydride compounds have done by using 2,2 Diphenyl-1- Picryl Hydrazyl(DPPH).

Keywords: Green synthesis, Stobbe condensation, Photochromic Fulgides, aryl aldehydes & ketones and their products

1. Introduction:

The earlier classical method involved use of hazardous solvents like benzene, ether etc for the formation of Fulgenic acid and their anhydride forms^{1, 2}. Also classical method consumed more time for the formation of required products.

The present work describes ecofriendly one pot synthesis method for Stobbe condensation in which solvent free condition improves the yield. As compared to classical condensation methods reported previously, in which extensive use of solvents and hazardous chemicals have involved; green method requires fewer amounts of dry solid reagents, for the

formation of acid esters. Moreover, heat energy consumption by the reaction is also averted.

Stobbe condensation under solvent free condition using solid potassium tertiary butoxide has done with dimethyl succinate and aromatic, aliphatic³ aldehyde and ketone which lead to the formation of the acid- esters, which on saponification yielded the corresponding diacids. This green approach not only increases the product's yield, but also maintains & raises its photochromic strength. Fulgenic acids (cyclised forms) are the promising materials⁴ in optical memory devices, optical switches and sensors, specially dyes and inks. These are representative class of photochromic organic⁵⁻⁷ molecules which exhibits several interesting properties for diverse applications in fields such as data storage or high resolution spectroscopy.

The anhydride products have prepared by cyclisation of diacids by using silica and perchloric acid. The antioxidant is a molecule that inhibits oxidation of biomolecule. Oxidation is a chemical reaction that can produce free radicals leading to chain reaction that may damage cells and initiates diseased condition. The term antioxidant mainly used for two different groups of substances, industrial chemicals which have added to products to prevent oxidation and natural chemicals found in food and body tissues which are said to have beneficial health effects. Antioxidants are classified into two broad divisions, depending on whether they are soluble in water (hydrophilic) or in lipids (lipophilic). In general, water soluble antioxidants react with oxidants in the cells cytosol and the blood plasma, while lipid soluble antioxidants protect cell membrane from lipid peroxidation⁸. In present study, we also determined the solubility property of Fulgenic acid esters. The different antioxidants