



Isomeric (E)-and (Z)- sulfidesulfones and bis-sulfones Conglomeration

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Abstract: A pair of (E)- and (Z)-2-(4-methylphenyl)-2-[(4-methylphenyl)thio]-1-phenyl-1-[(4-methylphenyl)sulfonyl] ethylenes were synthesised by the nucleophilic displacement of halogens with sodium salt of *p*-methylbenzenethiol from corresponding halo compounds. Oxidation of these two (E) and (Z)-2-(4-methylphenyl)-2-[(4-methylphenyl)thio]-1-phenyl-1-[(4-methylphenyl)sulfonyl] ethylene gave the corresponding pair of (E)- and (Z)-1,2-Bis[(4-methylphenyl)sulfonyl]-1-(4-methylphenyl)-2-phenyl ethylenes. The structures of these compounds were confirmed by IR, ¹H NMR and MASS spectral analysis.

Keywords: (E)- and (Z)-isomers, Sulfide-Sulfones; Disulfones

I. INTRODUCTION

Biological studies carried out on vinyl sulfonyl compounds [1], mercapto halo ethylene sulfone derivatives [2] and bis(organosulfonyl)ethylenes [3, 4] revealed that they can be used as effective fungicides to protect seeds. The biological activities of these compounds depend mainly on their stereochemical configurations (*cis* and *trans*) and their substituents present in them. Further more vinyl sulfones have been known for their synthetic utility in organic chemistry, easily participating in 1,4-addition reactions. This functional group has also recently been shown to potently inhibit a variety of enzymatic processes, providing unique properties for drug design and medicinal chemistry [5]. Divinyl sulfones and hydroxydiethyl sulfones are used to give crease-resistant finishes, while other sulfones are used as fuel additives and antibacterial agents, plasticizers, agriculture and anti-icing additives [6-9]. The most common method employed for the preparation of unsaturated disulfones is by the nucleophilic displacement [8,10] of halogens with thiols from halo ethylene sulfone derivatives. The present note describes the preparation of a mixture (E) - and (Z)-1-(4-methylphenyl)-2-phenyl-1-(4-methyl phenyl) thio ethylenes and its conversion in to (E)-and (Z)-1,2-Bis[(4-methylphenyl)sulfonyl]-1-(4-methylphenyl)- 2-phenyl ethylenes. Although some reports [11-18] have appeared on the synthesis of *cis* and *trans* sulphide-sulfones and di sulfones, the data available is scanty.

II. EXPERIMENTAL SECTION

Melting points were determined in open capillaries on Mel-Temp apparatus, Laboratory devices, Cambridge, U.S.A and are uncorrected. IR spectra were recorded using KBr pellets on Perkin-Elmer SPECTRUM 100 FT-IR spectrophotometer. HNMR spectra were recorded at 400 MHz on a BRUKER-400 spectrometer and their chemical shifts are reported in δ ppm with respect to TMS as an internal standard. Mass spectra were recorded on Micro Mass ESI-TOF Mass Spectrometer. The following chemical solutions are prepared and analyzed (E)- and (Z)-2-[(4-methylphenyl)]-1-phenyl-1-[(4-methylphenyl)thio] ethylenes (1) (E)- and (Z)- 2-bromo-2-(4-methylphenyl)-1-phenyl-1-[(4-methylphenyl)thio] ethylenes (2a & 2b) (E)-2-bromo-2-(4-methylphenyl)-1-phenyl-1-[(4-methylphenyl) sulfonyl] ethylene (3a)

(Z)-2-bromo-2-(4-methylphenyl)-1-phenyl-1-[(4-methylphenyl) sulfonyl] ethylene (3b)
(E)-2-(4-methylphenyl)-2-[(4-methylphenyl)thio]-1-phenyl-1-[(4-methylphenyl)sulfonyl] ethylene (4a)
(Z)-2-(4-methylphenyl)-2-[(4-methyl phenyl)thio]-1-phenyl-1-[(4-methylphenyl)sulfonyl] ethylene (4b)
(E)-1,2-Bis[(4-methylphenyl)sulfonyl]-1-(4-methylphenyl)-2-phenyl ethylene (5a)
(Z)-1,2-Bis[(4-methylphenyl)sulfonyl]-1-(4-methylphenyl)-2-phenyl ethylene (5b)

III. RESULTS AND DISCUSSIONS

Phenyl *p*-methylbenzyl ketone₁₅ and *p*-methylbenzenethiol in dichloromethane led to the formation of a mixture of (E)- and (Z) -2-[(4-methylphenyl)]-1-phenyl-1-[(4-methylphenyl) thio] ethylenes (1). Compounds (E)- and (Z)-1,2-Bis [(4-methylphenyl) sulfonyl]-1-(4-methyl phenyl)-2- phenyl ethylenes were prepared (5a & 5b) starting from (E)-and (Z)-2-bromo-2-(4-methylphenyl)-1-phenyl-1-[(4-ethylphenyl)thio] ethylenes (2a & 2b) which in turn are obtained by the bromination of (E)- and (Z) -2-[(4-methylphenyl)]-1-phenyl-1-[(4-methylphenyl) thio] ethylenes (1)

IV. CONCLUSIONS

A new series of unsaturated Sulfide-Sulfones and Bis-Sulfones were prepared. The synthesized compounds with chemical structure may serve as a very promising basis for the development of effective antibacterial and antifungal agents.

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