

Short Note

***N*-(4-Methylsulfonamido-3-phenoxyphenyl)-9,10-dihydro-9,10-ethanoanthracene-11,12-dicarboximide**

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Abstract: The title compound, *N*-(4-methylsulfonamido-3-phenoxyphenyl)-9,10-dihydro-9,10-ethanoanthracene-11,12-dicarboximide was synthesized in high yield by reaction of *N*-(4-amino-2-phenoxyphenyl)methanesulfonamide and 9,10-dihydroanthracene-9,10-endo- α,β -succinic anhydride in glacial acetic acid. The structure of the compound was fully characterized by IR, ¹H and ¹³C NMR, mass spectral analysis and elemental analysis.

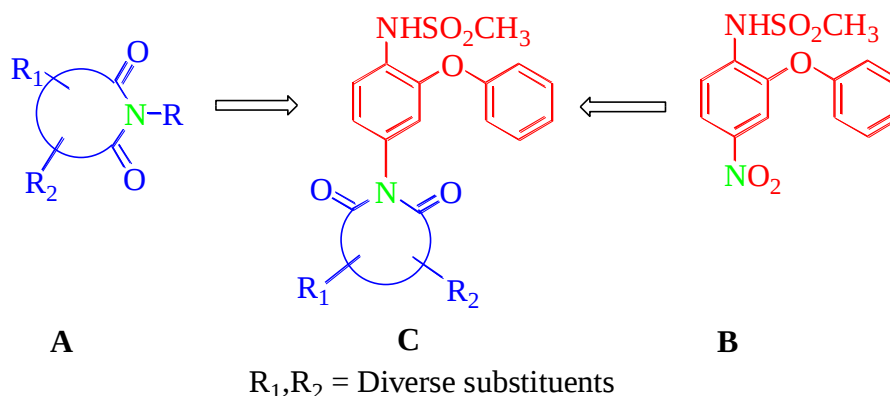
Keywords: sulfonamide; cyclic imide; nimesulide

Cyclic imides **A** (**Scheme 1**) represent an important class of bioactive molecules that shows a wide range of pharmacological activities such as androgen receptor antagonistic, anti-inflammatory, anxiolytic, antiviral, antibacterial, antitumor, antispasmodic, antinociceptive and antineoplastic properties [1-13].

On the other hand *N*-(4-nitro-2-phenoxy phenyl)methane sulfonamide or nimesulide (**B**, **Scheme 1**), a preferential cyclooxygenase-2 (COX-2) inhibitor is one of the well known non-steroidal anti-inflammatory drugs (NSAIDs) that has been utilized to treat pain and other inflammatory diseases. Because of their common anti-inflammatory properties and our interest in nimesulide (*N*-(4-nitro-2-phenoxy phenyl)methane sulfonamide) derivatives [14-18] as potential anti-inflammatory agents we decided to prepare compound **C** having structural features of both **A** and **B** (**Scheme 1**).

We estimated that combination of structural features of cyclic imide (**A**) with nimesulide (**B**) in a single molecule (**C**) would provide novel agents possessing potent pharmacological activities.

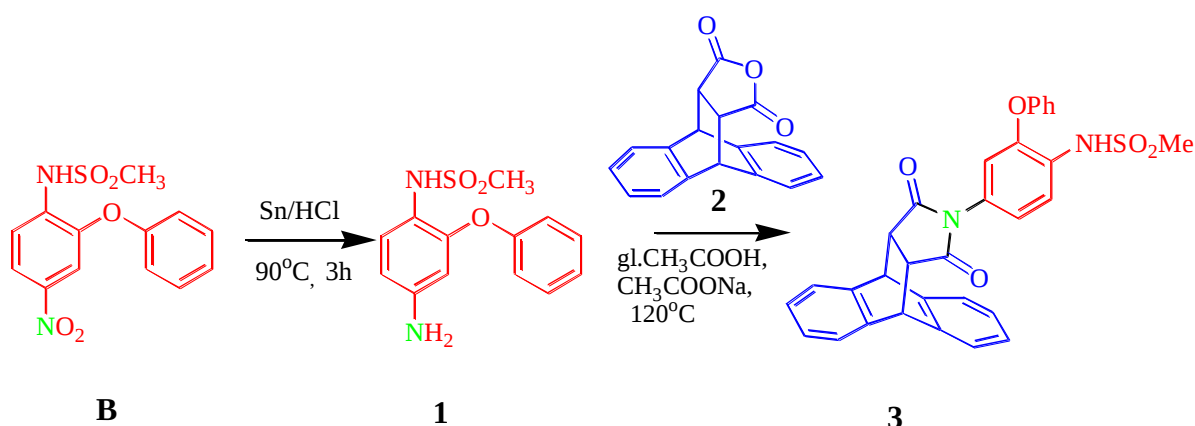
Scheme 1. Design of hybrid molecule.



We report the synthesis *N*-(4-methylsulfonamido-3-phenoxyphenyl)-9,10-dihydro-9,10-ethanoanthracene-11,12-dicarboximide (**3**) as hybrid molecule derived from *N*-(4-nitro-2-phenoxy phenyl)methane sulfonamide, **B**, nimesulide by straight forward condensation of the key intermediate *N*-(4-amino-2-phenoxy-phenyl)-methane sulfonamide (**1**) and 9,10-dihydro anthracene -9,10-endo- α,β -succinic anhydride (**2**).

The starting compound **1** (*N*-(4-amino-2-phenoxy-phenyl)-methane sulfonamide) required for our study was prepared [14] in quantitative yield from *N*-(4-nitro-2-phenoxy phenyl)methane sulfonamide **B**, (nimesulide) *via* reducing its nitro group as shown in **Scheme 2**.

Scheme 2. Synthesis of the title compound **3**.



To a mixture of aromatic amine, (*N*-(4-amino-2-phenoxy-phenyl)-methane sulfonamide) **1** (278 mg, 1.0 mmol) and 9,10-dihydroanthracene 9,10-endo- α,β -succinic anhydride (**2**) (276 mg, 1.0 mmol) in glacial acetic acid (3 mL) was added anhydrous sodium acetate (100 mg, 1.2 mmol) and the mixture was allowed to reflux for 20 min. After completion of the reaction (as indicated by TLC) the mixture was added to crushed ice (50 g) and stirred. The solid separated was filtered and dried. The crude product was purified by column chromatography followed by re-crystallization from chloroform.

Description of the compound: White solid.

Yield: 84%.

Mp: 309–311 °C.

R_f: 0.59 (CHCl₃:Ethyl acetate = 9:1).

IR $\nu_{\max}$ (KBr cm⁻¹): 3155, 1705, 1502, 1331, 1157.

Mass (ES): m/z 538 (M+1, 100%).

¹HNMR (400 MHz, DMSO-*d*₆): δ 3.0 (s, 3H), 3.31(s, 2H), 4.81(s, 2H), 5.87(d, *J* 2.2 Hz, 1H), 6.29 (dd, *J* 8.6 and 2.2 Hz, 1H), 6.86 (dd, *J* 5.2 and 3.3 Hz, 2H), 7.0 (d, *J* 7.6 Hz, 2H), 7.14–7.18 (m, 4H), 7.27–7.29 (m, 1H), 7.35 (d, *J* 8.5Hz, 1H), 7.46–7.50 (m, 4H), 9.35 (1H, NH).

¹³C NMR (75 MHz, CDCl₃): δ 30.9 (CH₃), 39.8, 45.9, 47.02, 115.6, 119.4, 120.6, 122.1, 124.3 124.9, 126.9, 127.0, 128.1, 128.2, 130.3, 138.5, 141.0, 147.2, 155.0, 175.8 (CO).

Anal. calc. for C₃₁H₂₄N₂O₅S: C, 69.39; H, 4.51; N, 5.22 . Found: C, 69.28; H, 4.46; N, 5.28.

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