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Short Note

(2*E*,2'*E*)-3,3-(1,4-Phenylene)bis[1-(2,5-dimethyl-3-thienyl)prop-2-en-1-one]

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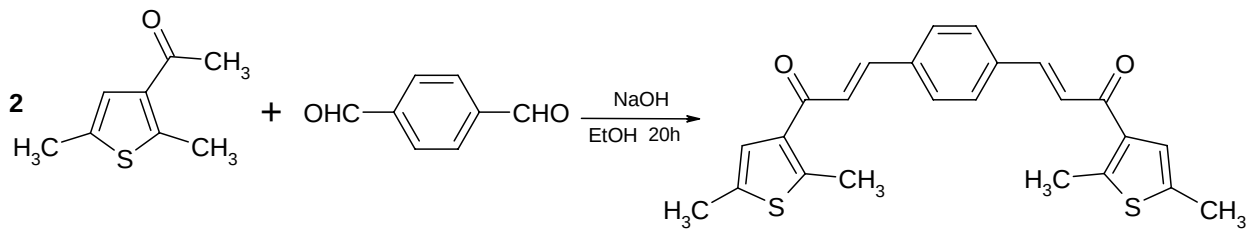
Abstract: A bis-chalcone has been synthesized by reaction of 3-acetyl-2,5-dimethyl-thiophene and terephthalaldehyde in ethanolic NaOH at room temperature: (2*E*,2'*E*)-3,3-(1,4-phenylene)bis[1-(2,5-dimethyl-3-thienyl)prop-2-en-1-one] **(3)** was obtained in high yield. The structure of this compound was established by elemental analysis, IR, ^{1}H NMR, ^{13}C NMR and EI-MS spectral analysis.

Keywords: chalcone; aldol condensation; terephthalaldehyde

Aldol condensations are important in organic synthesis, providing a good way to form α,β-unsaturated ketones known as chalcone [1]. Naturally occurring as well as synthetic chalcones are important for their biological activities. Compounds with α,β-unsaturated ketones have become of much interest in recent years on account of their antioxidant [2], antibacterial [3], antidepressant [4], antihypertensive [5] and anti-inflammatory activity [6].

They are also intermediates in the biosynthesis of flavonoids, which are substances widespread in plants and with an array of biological activities. Chalcones are also intermediates in the synthesis of flavones and cyclization of chalcones can give rise to other heterocyclic compounds such as pyrazoles and oxazoles. In view of these observations, author has synthesized a novel bis-chalcone.



(1) **(2)** **(3)**

A solution of 3-acetyl-2,5-dimethylthiophene (4.14 mL, 0.029 mol) and terephthalaldehyde (2 g, 0.014 mol) in ethanolic solution of NaOH (6 g in 10 mL of ethanol) was stirred for 20 h at room temperature. The solution was poured into ice cold water of pH~2 (pH adjusted by HCl). The solid was separated and dissolved in CH_2Cl_2, washed with saturated solution of $NaHCO_3$ and evaporated to dryness. The residual was recrystallized from methanol/chloroform.

Dark yellow solid (Chloroform); Yield: 78%; m.p. 194-195 °C.

EI-MS m/z (rel. int.%): 407 (40) $[M+1]^+$, 255 (70), 153 (45).

IR (KBr) ν_{max} cm^{-1}: 3050 (Ar-H), 2914 (C-H), 1648 (C=O), 1585 (C=C).

^{1}H NMR (DMSO-d_6) (δ/ppm): 7.71 (d, 2H, J = 15.6 Hz, C=CH), 7.30 (d, 2H, J = 15.6 Hz, CO=CH), 7.64 (s, 4H, Ar-H), 7.09 (s, 2H, thiophene-H), 1.61 (s, CH_3).

^{13}C NMR (DMSO-d_6) (δ/ppm): 186.09, 147.77, 142.36, 136.77, 136.47, 135.46, 130.21, 125.76, 15.98, 15.07.

Anal. calc. for $C_{24}H_{22}O_2S_2$: C, 70.91, H, 5.41, S, 15.57, Found: C, 70. 86, H, 5.35, S, 15.52.

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References and Notes

1. Dreoni, D.P.; Pinelli, D.; Trifiro, F. Synthesis of cyclohexanone oxime via ammoximation with molecular oxygen: The reaction network. *J. Mol. Catal.* **1991**, *69*, 171–190.
2. Yi, W.; Wu, X.; Cao, R.; Song, H.; Ma, L. Biological evaluations of novel vitamin C esters as mushroom tyrosinase inhibitors and antioxidants. *Food Chem.* **2009**, *117*, 381–386.
3. Wang, L.; Zhang, P.; Zhang, X.; Zhang, Y.; Li, Y.; Wang Y. Synthesis and biological evaluation of a novel series of 1,5-benzothiazepine derivatives as potential antimicrobial agents. *Eur. J. Med. Chem.* **2009**, *44*, 2815–2821.

4. Yusuf, M.; Khan, R.A.; Ahmed, B. Syntheses and anti-depressant activity of 5-amino-1,3,4-thiadiazole-2-thiol imines and thiobenzyl derivative. *Bioorg. Med. Chem.* **2008**, *16*, 8029–8034.
5. Abdel-Wahab, B.F.; Abdel-Aziz, H.A.; Ahmed, E.A. Synthesis and antimicrobial evaluation of 1-(benzofuran-2-yl)-4-nitro-3-arylbutan-1-ones and 3-(benzofuran-2-yl)-4,5-dihydro-5-aryl-1-[4-(aryl)-1,3-thiazol-2-yl]-1H-pyrazoles. *Eur. J. Med. Chem*. **2009**, *44*, 2632–2635.
6. Tewtrakul, S.; Subhadhirasakul, S.; Karalai, C.; Ponglimanont, C.; Sarot Cheenpracha, S. Anti-inflammatory effects of compounds from *Kaempferia parviflora* and *Boesenbergia pandurata. Food Chem.* **2009**, *115*, 534–538.