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One Spot Synthesis of New N-Substituted Acridinediones by Hantzsch condensation

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ABSTRACT

Acridinediones were synthesized by the one-pot Hantzsch condensation of an aromatic amines, 2-(4-floro phenyl)-5-bis(1,3diketo-5,5-dimethyl cyclohexyl)methylfuran in acetic acid and the reaction mixture is refluxed for eighteen hours, the crushed ice the solid obtained was filtered and purified by column chromatography. The compound was characterized by using different spectrochemical characterizations.

Keyword: Acridinediones, Hantzsch condensation, Aromatic amine, Column Chromatography.

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INTRODUCTION

Death and morbidity caused by malaria are on the increase, largely as a result of parasite drug resistance [1]. Consequently, there are more people dying of malaria now than there were 20 years ago. Recognition of this problem by the international community and the engagement of the pharmaceutical industry and other key stakeholders has catalyzed the concerted search for new antimalarial drugs with novel targets[2-4]. 1, 4-Dihydropyridines as analogues of nicotinamide adenine dinucleotide (NADH) coenzymes exhibit a wide range of biological activities, such as calcium channel blocking, and today they are widely used in pharmacology [5]. Acridines which possess the 1,4-dihydropyridine parent nucleus have interesting pharmaceutical properties such as a positive iontropic effects promoting the entry of calcium to the intracellular space [6], and 1,8-(2H,5H)-acridinediones are known as laser dyes . 1,8-(2H,5H)-Acridinediones were synthesized by the adoption of the Hantzsch procedure, i.e., by the thermal reaction of 5,5-dimethyl-1,3-cyclohexanedione (dimedone) with an aldehyde and ammonia. Most of the methods reported previously usually require long reaction times, afford 1,4-dihydropyridines in relatively low yield, and suffer from utilizing harmful organic solvents in most cases. [7-15]

MATERIALS AND METHOD

1 H-NMR spectra were recorded on a Bruker Avance-400 (400 MHz) spectrometer (Bruker, Switzerland), and chemical shifts (δ) are reported in parts per million relative to tetramethylsilane and coupling constants (J) in Hz. Splitting patterns are designated as s, singlet; d, doublet; br, broad. 13C-NMR spectra were recorded on the same spectrometer (at 100 MHz) with complete proton decoupling, and chemical shifts are reported in parts per million relative to the solvent resonance used as the internal standard (CDCl3, δ 77.16 ppm; DMSO-d6, δ 39.52 ppm). IR spectra were taken on a Bruker Vector-22 spectrometer (Bruker, Switzerland) in KBr pellets and are reported in cm−1 . Melting points were determined on an XT-4 apparatus (Beijing Tech Instrument Co., Beijing, China). Analytical TLC and column chromatography were performed on silica gel GF254 and silica gel H60, respectively

RESULTS AND DISCUSSION

it is prepared by treating 4-methyl aniline with 2-(4-floro phenyl)-5-bis(1,3diketo-5,5-dimethyl cyclohexyl) methylfuran in acetic acid and the reaction mixture is refluxed for eighteen hours and the reaction mixture is cooled and poured into the crushed ice the solid obtained was filtered and purified by column chromatography over the silica gel and eluted with $CHCl_3$ - MeOH (6:4).

Data Analysis

Yield: 68 %, m.p. 212-214 °C; IR (KBr) 1695, 1675, 1557, 1384 cm^{-1}. ^{1}H NMR (300 MHz, $CDCl_3$): δ 1.440 (s, 12H, CH_3), 1.677 (s, 4H, CH_2), 2.668 (s, 3H, CH_3), 2.851 (s, 4H, CH_2), 4.786 (s, 1H, CH), 6.680 (d, 2H, Ar-H, J= 6.6 Hz), 7.193-7.240 (m 2H, Ar-H), 7.282-7.380 (m 2H, Ar-H), 7.4365 (d, 2H, Ar-H, J= 8.1 Hz), 7.713 (d, 2H, Ar-H, J= 7.8 Hz), C^{13} NMR : C-CH_3 (17.254), C-CH_3 (27.109), CH (31.647), CH_2(45.154), CH_2(55.902), C-Ar (100.129-153.429), C=O (196.647). EM-MS: m/z 524.1 (M+1). Anal calcd. for $C_{34}H_{34}FNO_3$: C, 77.99; H, 6.54; N, 2.67. Found: C, 78.04; H, 6.59; N, 2.74.

CONCLUSION

In summary, acridinediones and polyhydroquinoline derivatives were synthesized by the one-pot Hantzsch condensation of an an aromatic amines, 2-(4-floro phenyl)-5-bis(1,3diketo-5,5-dimethyl cyclohexyl)methylfuran in acetic acid. The compound finds versatile applications in biopharmaceutical chemistry. The compound is mainly known for its antimalarial activity.

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