ISSN: 0974 - 7516 Volume 7 Issue 3

Trade Science Inc.

Organic CHEMISTRY

An Indian Journal

Short Communication

OCAIJ, 7(3), 2011 [184-186]

Synthesis of N-(5-methyl-4-oxo-2-substituted phenyl-3H-thiazolidine-3-yl)-2-(3'-substituted phenyl spiro [3H-indole-3,2'-thiazolidine]-2,4'-(1H)-dione-1-yl)-)acetamide

Ashvini Kumar Saxena*, Ketan H.Sikotra, Lahu R.Teli, U.C.Mashelkar

Organic Research Laboratory, Patkar-Varde College, Goregaon (W), Mumbai - 400 062, (INDIA)

E-mail : asaxena_2002@yahoo.com

Received: 12th October, 2010 ; Accepted: 22th October, 2010

ABSTRACT

Some of N-(5-methyl-4-oxo-2-substituted phenyl-3H- thiazolidine-3-yl 2-(3'-substituted phenyl spiro [3H-indole-3,2'-thiazolidine]-2,4'-(1H)-dione-1-yl)-)acetamide have been synthesized by the cyclocondensation of N'-substituted benzylidene-2-(3'-substituted phenyl-spiro[3H-indole-3,2'-thiazolidine]-2,4-(1H)-dione-1-yl)acetohydrazide with thiolactic acid.

KEYWORDS

Spiroindole;
Thiazolidine.

INTRODUCTION

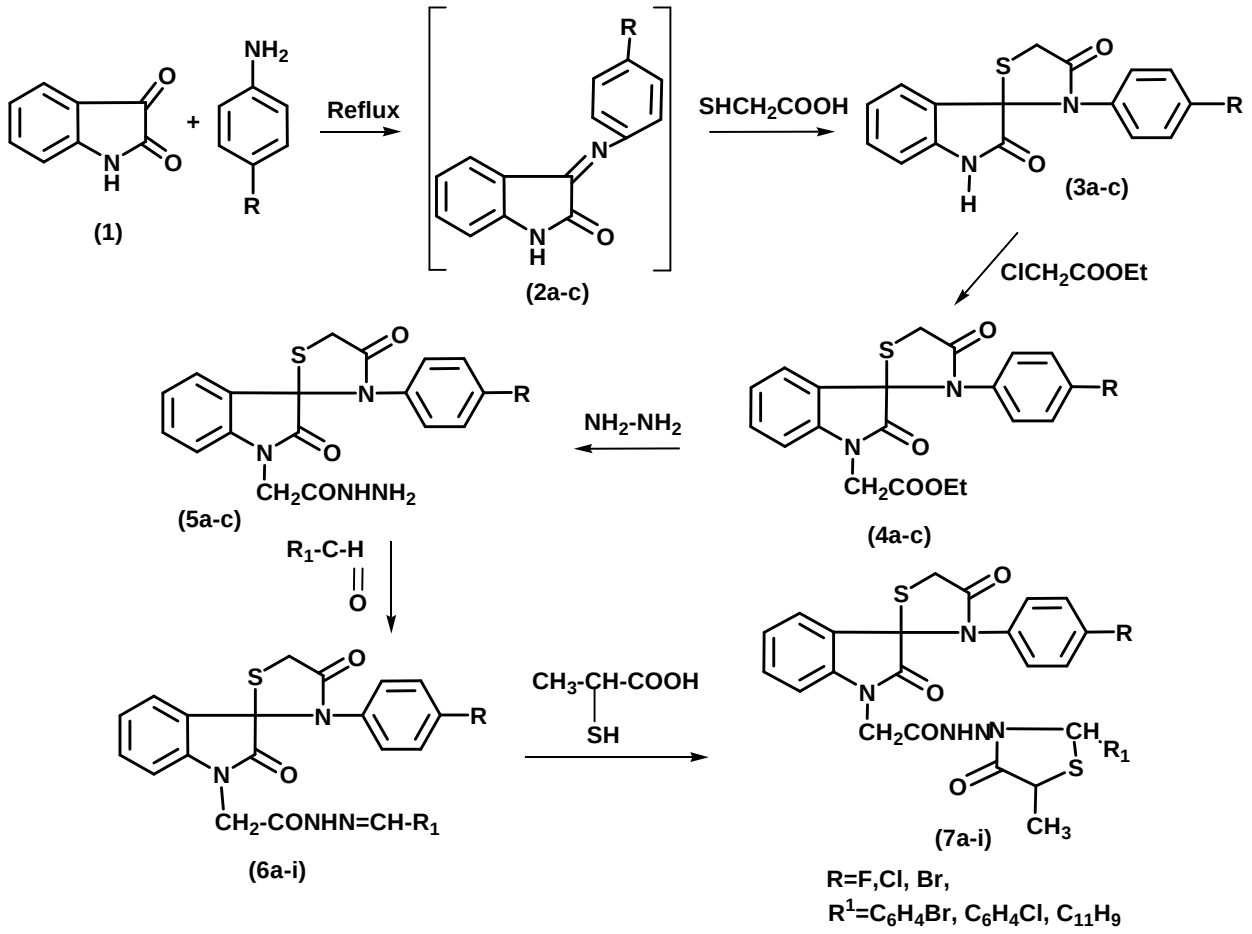
Spiroindoles[1-3] and thiazolidimones[4,5] have been found to remarkable pharmaceuticals properties. These encourage us to synthesized, some of N-(5-methyl-4-oxo-2-substituted phenyl-3H-thiazolidine-3-yl)-2-(3'-substituted phenyl spiro [3H-indole-3,2'-thiazolidine]-2,4'-(1H)-dione-1-yl)-)acetamide **(7a-i)**. The title compounds **(7a-i)** and it's analogs were prepared by method outlined in the Scheme 1 and summarized in TABLE 1. Following the literature procedure[6] 2-(3'-substitutedphenylspiro[3H-indole-3,2'-thiazolidine] 2,4'(1H)dione-1-yl)aceto hydrazides **(5a-c)** was prepared which undergoes shift base reaction with different aromatic aldehyde gave N'-substituted benzylidene-2(3'-substituted phenyl-spiro[3H-indole-3,2'-thiazolidine]-2,4'(1H)-dione-1-yl)acetohydrazide **(6a-e)**. These further react with thiolactic acid yielded desired products **(7a-i)**. The purity & structure of the products **(7a-i)** were established on the basis of their spectral (IR & 1H NMR) data and TLC. Physical data are given in TABLE 1.

EXPERIMENTAL

Melting points were determined on Buchi B-545 melting point apparatus and are uncorrected. IR spectrum was recorded in KBr on a Perkin Elmer spectrometer, ^{1}H NMR was recorded in DMSO-d6 using 300MHz brucker spectrometer (Chemical shift in δ ppm).with TMS as internal standard. The TLC was performed on precoated Silica-gel sheets obtained from Merck & Co., Germany, which were visualizing using UV light. The analytical Research Department of Ipca Labs. Ltd. (Kandivali, Mumbai) carried out all analytical work.

N^1-4-chlorobenzylidene-2-(3'-(4-bromophenyl)-spiro[3H-indole-3,2'-thiazolidine)-2,4'-(1H)-dione-1-yl)-acetohydrazide (6h)

A Mixture of 2-[3'-(4-bromophenyl)-spiro-[3H-indole-3,2'-thiazolidine]2,4(1H)dione-1-yl)acetohydrazide (3.0gm, 0.0067 mole), 4-chlorobenzaldehyde (0.94gm, 0.0067mole), and few



Scheme 1

TABLE 1 : Characterization data of compound (5a-c), (6a-I) & (7a-i)

Compound	R	R^1	Molecular Formula	M.P. °C	Yield %	Compound	R	R^1	Molecular Formula	M.P. °C	Yield %
5a	F	--	$C_{18}H_{15}FN_4O_3S$	260°C	91%	6i	Br	$C_{11}H_9O$	$C_{30}H_{23}BrN_4O_3S_2$	235°C	81%
5b	Cl	--	$C_{18}H_{15}ClN_4O_3S$	192°C	90%	7a	F	C_6H_4Br	$C_{28}H_{22}BrFN_4O_4S_2$	166°C	75%
5c	Br	--	$C_{18}H_{15}ClN_4O_3S$	181°C	89%	7b	F	C_6H_4Cl	$C_{28}H_{22}ClFN_4O_4S_2$	147°C	71%
6a	F	C_6H_4Br	$C_{25}H_{18}BrFN_4O_3S_2$	244°C	77%	7c	F	$C_{11}H_9O$	$C_{33}H_{27}FN_4O_5S_2$	151°C	68%
6b	F	C_6H_4Cl	$C_{25}H_{18}ClFN_4O_3S_2$	225°C	79%	7d	Cl	C_6H_4Br	$C_{28}H_{22}BrClN_4O_4S_2$	135°C	65%
6c	F	$C_{11}H_9O$	$C_{30}H_{23}FN_4O_4S_2$	208°C	80%	7e	Cl	C_6H_4Cl	$C_{28}H_{22}Cl_2N_4O_4S_2$	158°C	67%
6d	Cl	C_6H_4Br	$C_{25}H_{18}BrClN_4O_3S_2$	254°C	82%	7f	Cl	$C_{11}H_9O$	$C_{33}H_{27}ClN_4O_5S_2$	161°C	69%
6e	Cl	C_6H_4Cl	$C_{25}H_{18}Cl_2N_4O_3S_2$	205°C	81%	7g	Br	C_6H_4Br	$C_{28}H_{22}Br_2N_4O_4S_2$	171°C	73%
6f	Cl	$C_{11}H_9O$	$C_{30}H_{23}ClN_4O_4S_2$	250°C	84%	7h	Br	C_6H_4Cl	$C_{28}H_{22}BrClN_4O_4S_2$	174°C	72%
6g	Br	C_6H_4Br	$C_{25}H_{18}Br_2N_4O_3S_2$	221°C	78%	7i	Br	$C_{11}H_9O$	$C_{33}H_{27}BrN_4O_5S_2$	156°C	70%
6h	Br	C_6H_4Cl	$C_{25}H_{18}BrClN_4O_4S_2$	208°C	75%						

drops of glacial acetic acid in ethanol (30ml) was refluxed for 8 hrs. Reaction was monitoring by TLC. After completion of reaction mixture was cooled at room temperature and poured in to cold water. The light yellow solid precipitate was isolated by filtration & dried. Further purification of product by crystallization from mixture of solvents chloroform/ methanol afford **(6h)** in pure form in 77% yield, M.P. 208°C

IR (cm^{-1}):3300 (N-H), 3054 (C-H, aromatic), 2972,2930 (C-H, alkyl), 1733, 1691 (C=O), 1581, 1471 (C=C, aromatic), ^1H NMR : δ 4.00-4.18 (dd,2H,-SCH_2), 4.85-4.92 (dd,2H,-NCH_2), 7.00-

Short Communication

8.11 (m,12H,Ar-H), 11.75 (S, 1H,NH).

Similar procedure was followed to synthesize other derivative **(6a-i)**.

N-(5-methyl-4-oxo-2-(4-chlorophenyl)-3H-thiazolidine-3-yl)-2-(3'-(4-bromophenyl-spiro[3H-indole-3,2'-thiazolidine]-2,4'-(1H)-dione-1-yl)-acetamide (7h)

A mixture of N'-4-chlorobenzylidene-2-(3'-(4-bromophenyl)-spiro[3H-indole-3,2'-thiazolidine)-2,4'-(1H)-dione-1-yl)-acetohydrazide (2.0gm, 0.0037mole) and thiolactic acid (0.60gm, 0.0056mole) in dry toluene (30ml) was reflux for 12 hrs. Collect the water azeotropically with dean-stark assembly and monitoring the reaction by TLC. After completion of reaction distilled out half of the toluene. Keep the reaction mass in deep-freez for 8 hrs. filter the pure crystallized product and wash with cold toluene gave **(7h)** in 72% yield M.P. 174°C.

IR (cm^{-1}): 3238 (N-H), 3049 (C-H, Aromatic), 2978, 2928 (C-H, alkyl), 1731, 1698 (C=O). ^1H NMR : δ 1.47-1.48(d, 3H, CH-CH_3), 4.02-4.21 (dd, 2H, -SCH_2), 4.37-4.39 (m, 3H, N-CH_2 + S-CH), 5.76-5.76 (d, 1H, CH), 7.02-7.82 (m, 12H, Ar-H)

Similar procedure was followed to synthesize other derivative **(7a-i)**.

ACKNOWLEDGEMENT

The authors are thankful to IPCA labs ltd. (Kandivali Mumbai) for carried out all analytical work like ^1H NMR, IR etc. Also thankful to Dr. Ashok Kumar-President, Ipca Labs. Ltd. (Kandivali, Mumbai) for his valuable guidance & suggestion during research work.

REFERENCES

[1] N.A.Jonsson, L.Mikiver, P.Moses; Chem.Abstr., **78**, 159460g **(1973)**.
[2] H.Oyomasu, H.Takahashi; Chem.& Pharma.Bull., **23**, 1431 **(1975)**.
[3] K.Ninomiya; Jpn.Kokai Tokkyo Koho., 80, 164, 683 **(1980)**; Chem.Abstr., **95**, 25036r **(1981)**.
[4] A.Grate, M.Liebig, G.Dransch; Chem.Abstr., **79**, 9921g **(1973)**.
[5] J.J.Bhatt, B.R.Shah, H.P.Shah, N.C.Desai; Indian J.Chem.Soc., 33(B), **21**, 189-92 **(1994)**.
[6] K.Joshi, A.Dandia, S.Bhagat; Indian J.Chem., **29**, 766 **(1990)**.