МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
НАЦІОНАЛЬНА АКАДЕМІЯ НАУК УКРАЇНИ
ДОНЕЦЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ
ІМЕНІ ВАСИЛЯ СТУСА
ІНСТИТУТ ФІЗИКО-ОРГАНІЧНОЇ ХІМІЇ І ВУГЛЕХІМІЇ
ІМ. Л. М. ЛИТВИНЕНКА НАН УКРАЇНИ

ХІМІЧНІ ПРОБЛЕМИ СЬОГОДЕННЯ

Десята Українська наукова конференція
студентів, аспірантів і молодих учених
з міжнародною участю

ЗБІРНИК ТЕЗ ДОПОВІДЕЙ

ДО 80-РІЧЧЯ ДОННУ ІМЕНІ ВАСИЛЯ СТУСА

27–29 березня 2017 р.
м. Вінниця

SYNTHESIS OF N,N'-DISUBSTITUTED THIOUREAS AS INTERMEDIATES FOR SYNTHESIS OF 1,3-THIAZOL-2(3H)-IMINE DERIVATIVES

Yeromina H. O., Perekhoda L. O., Ieromina Z. G., Sych I. A., Grinevich L. A.
National University of Pharmacy
annerem2012@gmail.com

The Hantzsch condensation reaction was the first method employed for the synthesis of 2-aminothiazole moiety using an α-haloketone and thiourea as starting materials. N-alkylated imino-thiazolines could be obtained by replacing thioureas with mono and N,N-disubstituted thioureas under different reaction conditions.

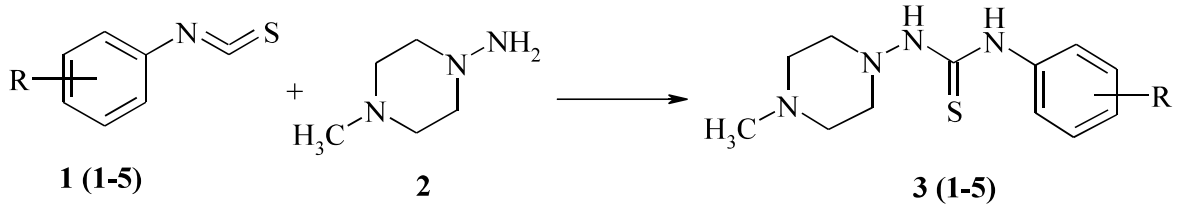
In continuation of our work on searching for biologically active substances among 2-R-phenylimino-1,3-thiazoline derivatives we planned to combine 2-R-phenylimino-1,3-thiazoline and N-methylpiperazine moiety in one molecule and synthezise a series of 4-(R-phenyl)-N-(R`-phenyl)-3-(4-methyl-1-piperazinyl)-1,3-thiazol-2(3H)-imine derivatives. To achieve this purpose we planned to synthezise the intermediates – 1-(4-methylpiperazin-1-yl)-3-R-phenylthioureas for synthesis of target compounds.

The purpose of present work is synthesis of N,N'-disubstituted thioureas – 1-(4-methylpiperazin-1-yl)-3-R-phenylthioureas as intermediates for Hantzsch condensation reaction.

According to the literature the most widely used method of synthesis of N,N'-disubstituted thioureas involves using as the starting compounds N-nucleophiles – amines by treating them with different isocyanates. This method is quite simple and required short time to complete. So we decided to use it in our work.

The synthesis of 1-(4-methylpiperazin-1-yl)-3-R-phenylthioureas ***3 (1-5)*** has been carried out by interaction of different R-phenylisothiocyanates ***1 (1-5)*** and 4-methylpiperazin-1-amine ***2*** (Scheme):

Scheme



1 (1-5) **2** **3 (1-5)**

where for compounds **1, 3:**
R=H, R=4-OC_2H_5, R=2,3-$(CH_3)_2$, R=3-CH_3, R=4-OCH_3 R=4-OC_2H_5

The reaction was conducted at room temperature in dry dioxane medium while reaction monitoring by thin-layer chromatography with good products yields.

Structures and purity of synthesized compounds ***3 (1-5)*** were confirmed by ^{1}H NMR-spectra, melting points and elemental analysis.

Analysis of ^{1}H NMR-spectra of 1-(4-methylpiperazin-1-yl)-3-R-phenylthioureas ***3 (1-5)*** are displayed well defined general resonance signals of the aromatic protons as multiplets at δ = 6.81–7.86 ppm and downfield signals at δ = 8.95–9.40 ppm as two singlets of both NH-groups. The signals of N-methylpiperazine residue protons for all compounds are presented at spectra as multiplets at δ = 2.25–2.95 ppm (piperazine) and as singlets δ = 2.20 ppm (methyl group of piperazine).