Review _____ *Thematic Section:* Preparative Chemistry.
Registration Code of Publication: 10-23-13-18 Subsection: Chemistry of Heterocycles.
Publication is available for discussion in the Internet as a material of "All-Russian Working Chemical Conference "*Butlerov's Heritage-2011*". http://butlerov.com/bh-2011/
Contributed: October 20, 2010.

From simple compounds to complex sulfur-nitrogen heterocycles

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Keywords: *sulfur monochloride, heterocycles, one-pot synthesis, 1,2-dithioles, 1,2,3,4,5-pentatthiepins, 1,2,3-dithiazoles, tertiary amines.*

Abstract

Sulfur-nitrogen heterocycles are attractable compounds due to their wide possibilities for using in medicine, agricultural chemistry and engineering. In recent years we have discovered some remarkable transformations of readily available organic compounds into complex heterocyclic molecules upon treatment with disulfur dichloride, S_2Cl_2, in the presence of tertiary amines. In the course of this work, we have found that this strategy is effective for the synthesis of a wide range of sulfur-nitrogen heterocyclic compounds, including the previously unknown ones with new ring systems. These new synthetic methods will be discussed, together with some unexpected cascade reactions and molecular rearrangements for which reaction mechanisms will be presented. The present review is focused on the new methods of synthesis as well as the unexpected cascade reactions and molecular rearrangements.