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Structure of new derivatives of 1,8-diaminonaphthalenes (''proton sponge'')

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Structures of 8-dimethylamino-1-methylamino-4-nitronaphthalene (**1**), 1-dimethylamino-8-methylamino-4-nitronaphthalene (**2**), 1-dimethylamino-2,7-dimethoxy-8-methylamino-3,5-dinitronaphthalene (**3**) and 1,2,4-tribromo-6-dimethylamino-5-methylaminoacenaphthylene (**4**) were studied for the first time [1,2]. The remarkable importance of intramolecular hydrogen bonds (IHB) has long been recognized in the chemistry of 1,8-bis(dimethylamino)naphthalene (''proton sponge'') and its numerous analogues [3]. It was shown that the formation of IHB in proton sponges is responsible for the unusually high basicity of this compound (pK_a=12.1, H_2O, 25(C) [4]. Symmetry and low-barrier character of the N ...H ...N bond in proton sponges attract considerable attention from the standpoint of theory modeling proton transfer processes in biological systems [5]. In this respect, structural parameters of hydrogen bridge in 1,8-diaminonaphthalenes are intriguing to study.
Correlations between basicity of ''proton sponges'' (**1-4**), IHB parameters and other geometric characteristics of the molecules will be discussed.

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m42.p07

Is planarity of pyridin-2-yl- and pyrazin-2-yl-formamide thiosemicarbazones related to their tuberculostatic activity?

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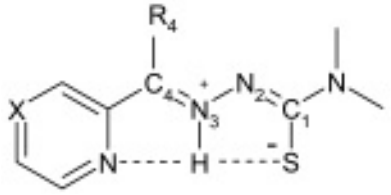
A significant increase of tuberculosis cases observed lately is caused by emerging resistance of *Mycobacterium tuberculosis* against classical antibacterial therapy. Therefore, even the most effective antibiotics show decreasing efficiency and a search for new tuberculostatics is becoming a pressing issue.
In this respect heterocyclic amidrazones attract significant attention since 1970. Lately a series of N'-thioamido substituted pyrazincarboxyamidrazones exhibiting desired tuberculostatic activity have been synthesized [1].
The most promising so far appeared N'-(azepan-1-ylcarbonothioyl)pyrazine-2-carboxyhydrazonamide, which molecular structures as well as of some its relatives has been determined by X-ray diffraction method in our laboratory.
The data show molecules to exist in a bipolar tautomeric form with two intramolecular hydrogen bonds and extensive conjugated system. The conjugation and hydrogen bonds result in planarity of the whole molecules under study except the cyclic amine group at C1. In addition, the positive charge at N3 strengthens intramolecular hydrogen bonds.



According to our hypothesis the observed planarity of the pyrazin-2-yl-formamide thiosemicarbazone fragment is a prerequisite for the tuberculostatic activity. Replacement of *ortho*-N-aromatic ring by a phenyl one unable to make a hydrogen bond with N3-H group destroys coplanarity of the ring with the rest of the system and suppresses tuberculostatic activity. We suppose also that other changes resulting in localization of π electrons and consequently in possible rotation around any single bonds being formed in the S-C1-N2-N3-C4 chain will also result in loss of the tuberculostatic activity.
Supporting evidence comes also from the observation that the flat pyridine-formamide thiosemicarbazone fragment resembles closely in spatial sense some acridine derivatives intercalating with DNA or RNA.

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