

REVIEW OF SULPHUR-HETEROCYCLES IN MEDICINAL CHEMISTRY

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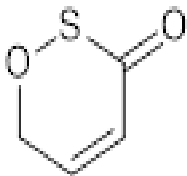
ABSTRACT

Heterocyclic chemistry has a broad spectrum of applications in our day-to-day life. Heterocyclic compounds account for the most prominent and diverse class of organic compounds. A significant number of sulphur heterocyclic compounds have been synthesized and such compounds have a wide range of uses in the field of medicinal chemistry. According to prior research, more than 90% of medicines containing heterocyclic compounds have been developed after the obtainment of a thorough scientific grasp of the biological system. The present article provides review regarding sulphur heterocyclic compounds

KEYWORDS : Heterocyclic compounds, Biological activity, Antiviral and Anti-inflammatory

INTRODUCTION

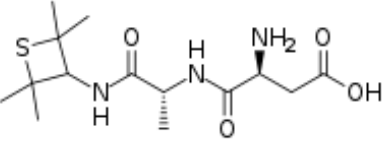
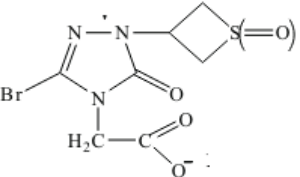
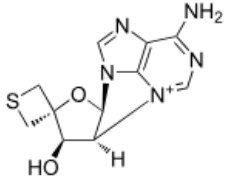
Heterocyclic compounds, often known as heterocycles, are organic chemical compounds having a ring-like structure that includes one or more heteroatoms. Heterocycles can be both cyclic and acyclic. The broadest and most diverse families of organic compounds are heterocyclic compounds. However, by substituting a part of carbon ring with heteroatoms, any carbocyclic compound, irrespective to the structure and function, may theoretically be transformed into a collection of heterocyclic analogues. The general structure of heterocycles is similar to that of cyclic organic compounds, which have only carbon atom in their structure, but the substitute of one or more carbon atoms by heteroatoms gives heterocycles physico-chemical properties that are distinct from those of all carbon ring analogs^{*1-10}

THIAZOLE	THIOPHENE	THIOPYRONE
		

Sulfur-containing heterocyclic compounds such as thiazole, thiophene, thiopyrone, widely exist in numerous natural products and biologically active molecules. Researchers found that sulfur atom could act as radical acceptors to build a C-S bond, and established a series of free radical reactions through this strategy. This emphasizes the significance of heterocycles in modern drug design^{*11}

Several FDA-approved medicines include sulfur heterocycles, such as clopidogrel, raloxifene, and rosiglitazone, which are used to treat peripheral arterial disease, breast cancer, and diabetes, respectively.^{*12}

Three-membered Rings

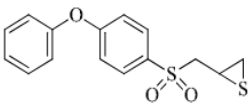
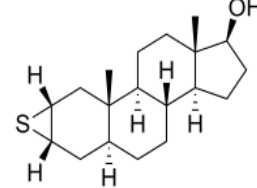
ALITAME an aspartic acid-containing dipeptide sweetener	2-(5-BROMO2,4-DIHYDRO-3-OXO-1,2,4-TRIAZOLYL-4)ACETATE SALTS antiplatelet and anticoagulant	SPIRONUCLEOSIDE Anti viral
		



Thiirane

The three-membered ring heterocycles containing single atoms of sulfur thiirane. Thiirane, more commonly known as ethylene sulfide, is the cyclic chemical compound with the formula C₂H₄S.

Molecules containing thiirane rings are more bactericidal than those containing oxirane rings, and some thiirane derivatives have found application as tuberculostats.^{*13}

2-(4-PHENOXY PHENYL)SULFONYLMETHYL) THIIIRANE Anti-cancer potent and highly selective inhibitor of human gelatinases	EPITIOSTANOL antineoplastic agent for the treatment of breast cancer since
	

Four-membered Rings

Thietane—four-membered rings containing, sulfur atom



Thietane

Thietanes are important aliphatic four-membered thiaheterocycles that are found in the pharmaceutical core and structural motifs of some biological compounds.^{*14}

Five Membered

Thiophene derivatives

Five-membered heterocycles with sulphur are employed more frequently as pharmacophores for various medicinal uses.

Thiophene is a monocyclic heteroarene that is furan in which the oxygen atom is replaced by a sulfur.^{*15}



Thiophene

<p>TIENILIC ACID diuretic drug with uric acid-lowering (uricosuric) action</p>	<p>ARTICAINE newest local anesthetic available in dental cartridges</p>	<p>OLANZAPINE antipsychotic medication schizophrenia and bipolar disorder</p>

Six-membered Rings

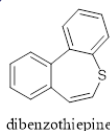
Six membered heterocycles containing nitrogen are valuable compounds, particularly in medicinal chemistry. From many decades, S-heterocycles have maintained their status as an important part and core of FDA approved drugs and medicinally active compounds.^{*16}



Thiopyran

<p>(4S-TRANS)-4-(METHYLAMINO)-5,6-DIHYDRO-6-METHYL-4H-THIENO(2,3-B)THIOPYRAN-2-SULFONAMIDE-7,7-DIOXIDE ant proliferative activity</p>	<p>CHLORPROMAZINE Antipsychotic medication.</p>	<p>THIORIDAZINE Schizophrenia. Other indications for use include other psychotic disorders, depressive disorders</p>

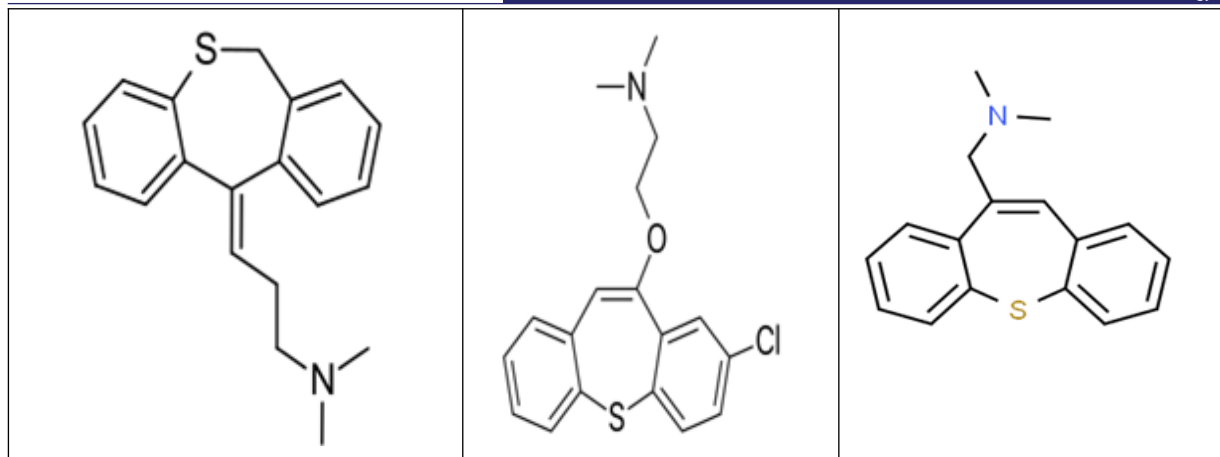
Seven-membered Rings



Thiazepines are seven-membered heterocyclic compounds

that contain nitrogen and sulfur atoms in a ring system. They have been explored for years as an important class of heterocyclic compounds and are used as structural features for the design and synthesis of bioactive agents with pharmacological activities. Thiazepines congeners usually play a key role of pharmacophore in drugs and are present in over 60 approved drugs.^{*17}

<p>QUETIAPINE schizophrenia, major depressive disorder.</p>	<p>OMAPATRILAT antihypertensive agent</p>	<p>TEMOCAPRIL is an ACE inhibitor.</p>
<p>DOSULEPIN antidepressant medicine that is used to treat depression.</p>	<p>ZOTEPINE acute and chronic schizophrenia</p>	<p>DAMOTEPINE treatment of anxiety</p>



CONCLUSION

Heterocyclic compounds are one of the most significant types of organic molecules in medicinal chemistry and they are used as medications for various diseases. Numerous impressive accomplishments have shown that heterocyclic compounds have a wide range of therapeutic drug applications. Heterocyclic compounds are versatile synthetic targets and key structural units in organic synthesis and medicinal chemistry because of their exciting biological activities. The potential applications of heterocycles as anticancer, anti-inflammatory, antifungal, antibacterial, anti-Alzheimer's, antiviral, antidiabetic agents, etc., have attracted substantial interest within the pharmaceutical community. Interestingly, an increasing number of heterocycles have been identified as potential drug candidates in ongoing drug development.

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