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Editorial

Mesoionic Compounds and its Application in Organic and Pharmaceutical Field

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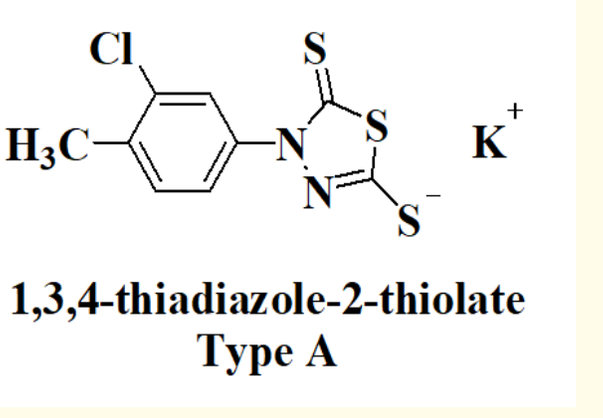
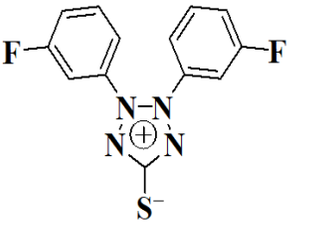
Compounds of the mesoionic class have interesting structural features provided by their betaine-like character. Mesoionic compounds (MICs) consist of a five-membered heterocyclic ring associated with a sextet of p and π electrons, in which both positive and negative charges are delocalized, have been known for more than a century [1,5]. In recent times, MICs have attracted the attention of chemists particularly because of the bonding aspects associated with their unusual structure which can be regarded as mesomeric heterocyclic betaines, strongly stabilized by π-electron delocalization and having large dipole moments [6]. The association of these characteristics suggests a high probability of strong interactions with biomolecules such as DNA and/or proteins [7]. Although mesoionic compounds are internally charged, they are neutral overall, and can therefore cross biological membranes *in vivo* [8]. The synthetic approaches to mesoionic heterocycles by 1,3 dipolar cycloaddition reactions are mostly those concerning münchnones (1,3-oxazolium-5-olates) and the newer isomünchnones (1,3-oxazolium-4-olates). Some work involving the mesoionic sydnones (1,2,3-oxadiazolium-5-olates), thiomünchnones (1,3-oxathiolium-5-olates) and thioisomünchnones (1,3-thiazolium-4-olates) have also appeared [9-12].



1,3,4-thiadiazole-2-thiolate
Type A



2,3-Bis(3-fluoro-phen-yl)tetra-zolium-5-thiol-ate
Type B

These compounds can be used for a variety of purposes both in medical and outside the medical environment [13]. Still, the overwhelming area that mesoionic compounds have been beneficial to have been the medical field. In the medicinal field, mesoionic compounds are used as drugs as antibacterial, antimalarial, anti-inflammatory, antitumor, antifungal, analgesic, and many more [14-18]. Most of the biological activity of mesoionic compounds are found in type A compounds while none have been found in type B compounds [19]. Another important aspect to the medical field is using mesoionic compounds as dyes. The sydnone ring specifically is very good at absorbing invisible spectra of ultraviolet and infrared light [20].

Mesoionic compounds are really useful not only for medicinal value, but because they are natural occurring being found in many other products. Some other products include vitamins such as vitamin B1 contains a mesoionic group. A couple other products which contain mesoionic compounds are insecticides, herbicides, and even some teas. Mesoionic compounds have also been used in the paper industry, tire industry and to make elastomeric polymers.

So out of all the important aspects of usefulness of these types of heterocyclic compound play a major role in chemical, biological and other application oriented prospective, makes it a prominent interest for researcher.

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