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PYRAZOLE – USEFUL TO MANKIND

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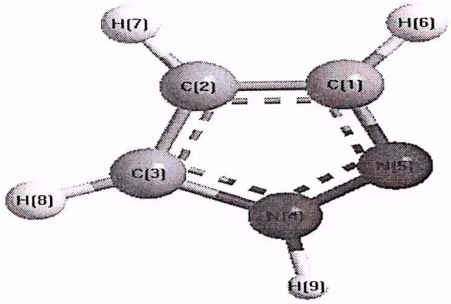
Abstract:

Pyrazoles are widely used as core motifs for a large number of compounds for various applications such as catalysis, agro-chemicals, building blocks of other compounds and in medicine. The attractiveness of pyrazole and its derivatives is their versatility that allows for synthesis of a series of analogues with different moieties. There is an increase in the interest of synthesizing, analyzing different properties, and seeking possible applications of pyrazole derivatives.

Key Word: Pyrazole

Introduction:

Pyrazole are five membered hetrocyclic compound having there carbon atom and two nitrogen atoms in adjacent position. Pyrazole is weak base. The nitrogen atom at position 2 with two electron is basic therefor reacts with electrophiles and nitrogen atom at position 1 is unreactive i.e, netural but loses its proton in the presens of base. Pyrazole are aromatic molecule due to their planner conjugated ring structure with six delocalized πelectrons

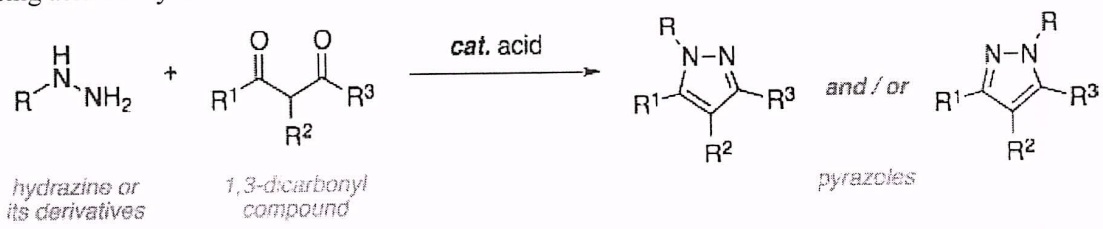


Physical properties of pyrazole:

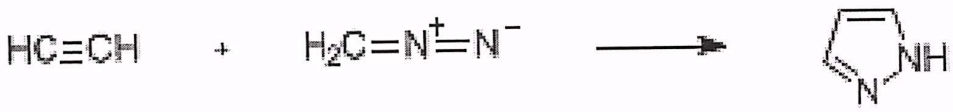
- Appearance - Colourless solid
- Melting point - 70°C
- Boiling point - 187°C
- Solubility- Soluble in water and almost, insoluble in petroleum ether

Histroy:

The term 'Pyrazole' was given to this class of compounds by German Chemist Ludwig Knorr in 1883.. Knorr synthesized pyrazole by hydrazine and its derivative with 1,3dicarbonyl compounds using acid catalyst.



In 1898 Han Von Pechmann synthesized pyrazole from acetylene & diazomethane



In 1954 Kosuge&Okeda are first person who isolated natural pyrazole derivative , 3-n-nonylpyrazole from Houttuyniacordata a plant of the piperaceae , this have antimicrobial activity .and also isolated levo –(1-pyrazole)alanine an amino acid from watermelon seeds

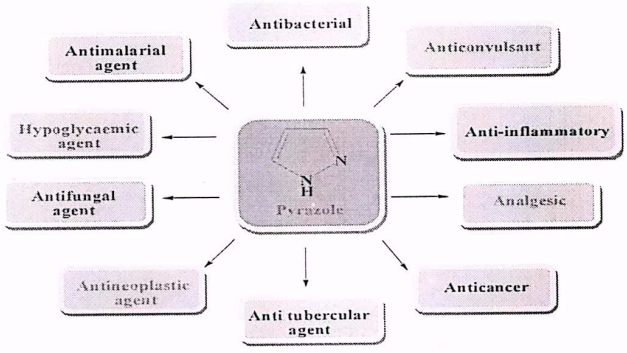
Discussion:

Pyrazoles are widely used as core motifs for a large number of compounds for various applications such as catalysis, agro-chemicals,dyes& pestiside industry, building blocks of other compounds and in medicine.Pyrazole based metal complexes for example have been studied as homogenous or supported catalysts.Fipronil&fenpyroximate are pyrazole derivatives , mainly used as weeding herbicides and pesticides with the characteristics such as high efficiency, good sterilization ability and low toxicity.

The attractiveness of pyrazole and its derivatives is their versatility that allows for synthesis of a series of analogues with different moieties in them, thus affecting the electronics and by extension the properties of the resultant compounds. In medicine pyrazole is found as a pharmacophore in some of the active biological molecules. While pyrazole derivatives have been extensively studied for many applications including anticancer, antimicrobial, anti-inflammatory, antiglycemic, anti-allergy and antiviral, much less has been reported on their metal counterparts in spite of the fact that metals have been shown to impart activity to ligands. Thus this perspective is intended to demonstrate the potential of pyrazole and pyrazolyl metal complexes in the areas of drug discovery and development. Several examples, that include palladium, platinum, copper, gold, zinc, cobalt, nickel, iron, copper, silver and gallium complexes, are used to bolster the above point.

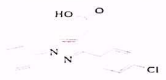
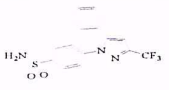
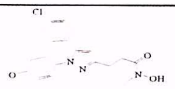
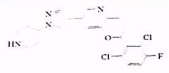
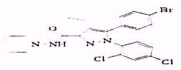
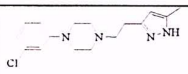
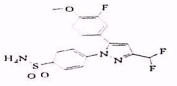
Biological importance of Pyrazole:

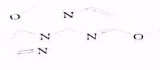
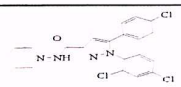
Fig- Different Biological Activities of Pyrazole Core



Drugs molecules containing Pyrazole moiety:

Sr.no	Name of the drug moleclue	Therapeutic category	Structure

1	Lonazolac	Non Steroidal anti-inflammatory	
2	Celecoxib	Non Steroidal anti-inflammatory	
3	Tepoxalin	Anti-inflammatory	
4	Crizotinib	Anti cancer	
5	Surinabant	CB1 Receptor	
6	Mepiperazole	Anxioylotic drug	
7	Deracoxib	Non Steroidal anti-inflammatory	

8	Epirizole	Non Steroidal anti-inflammatory	
9	Isolan	Insecticide	
10	Rimonabant	CB1 Receptor	

Conclusion:

Thepyrazoleringispresentasthecoreina varietyofleadingdrugs.This heterocyclic moiety possesses great pharmacological and medicinal significance. An extensive literature has been accumulated over the years and the chemistry of pyrazole continues to be a developing field. The versatile synthetic applicability and biological activity of these heterocyclic will help the medicinal chemists . So Pyrazole and its derivatives having considerable attention in research work & useful to mankind.

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