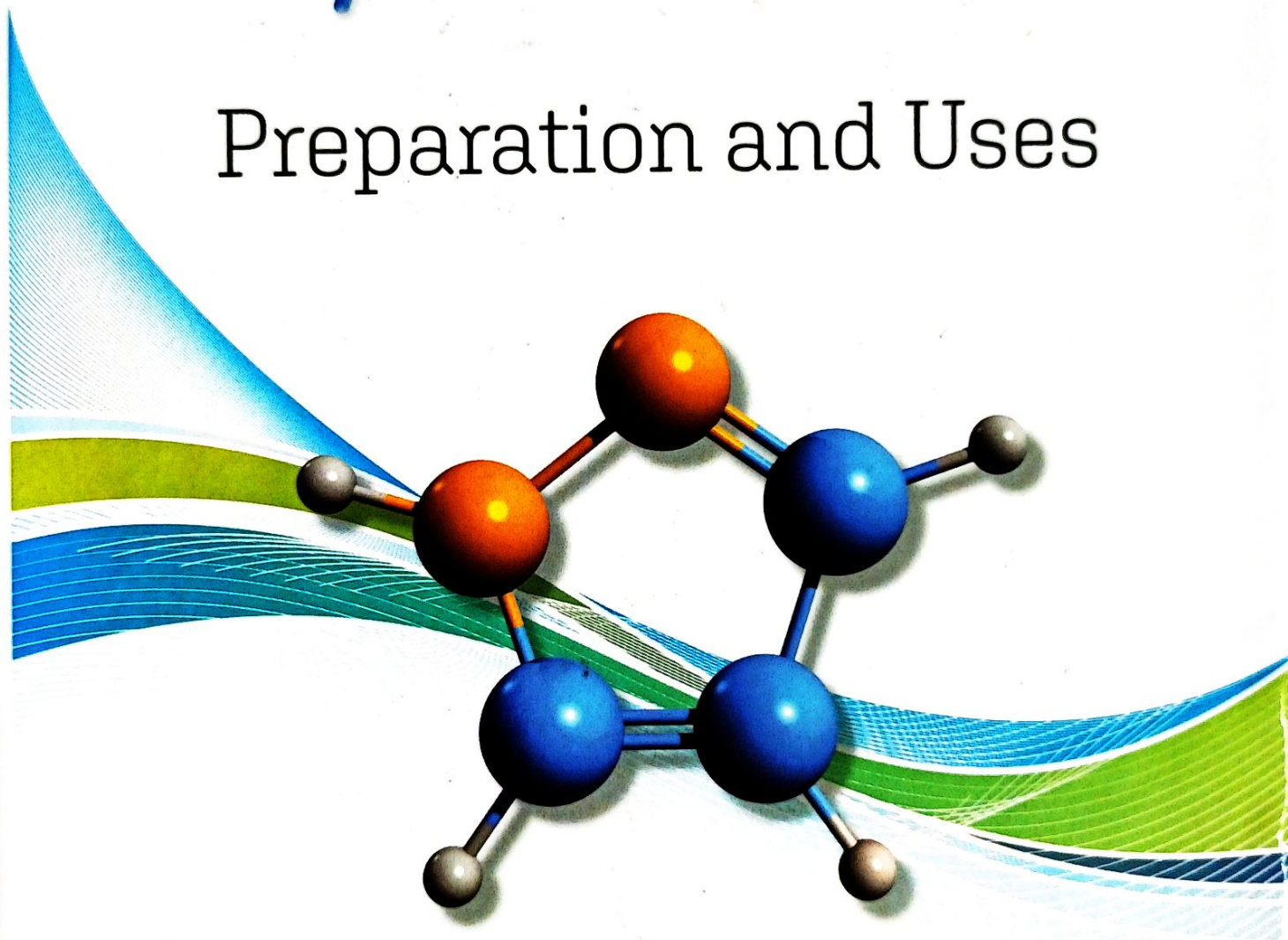


CHEMISTRY RESEARCH AND APPLICATIONS

Pyrazole

Preparation and Uses



Dilipkumar Pal

Editor

NOVA

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PYRAZOLE AND PYRAZOLE DERIVATIVES: A VERSATILE PLATFORM IN ANTI-CONVULSIVE DRUG DISCOVERY

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ABSTRACT

Convulsion is an episode, in which a person experiences altered consciousness and uncontrolled muscle spasms which causes jerky movements. The muscle movements are uncontrolled, not even or in pattern and involuntary. A person's specific body part or full body can be effected by convulsion and it can lasts for few seconds to few minutes. The primary causes of convulsions vary from vitamin (vit-B₆) deficiency to epileptic development in the primary motor cortex in the brain. Pyrazole is five membered ring system, containing carbon and nitrogen and having molecular formula of C₃H₄N₂. It can exhibit a broad spectrum of biological activities such as anti-microbial, anti-bacterial, anti-inflammatory, anti-fungal, neuro-protective, and ACE inhibitors. In this book chapter, we discuss about recent reports of pyrazole and pyrazole derivatives with anti-convulsive properties with their synthetic pathways.

Keywords: convulsion, epilepsy, pyrazole, anti-microbial, anti-bacterial, anti-inflammatory, anti-fungal, neuro-protective, ACE inhibitor

INTRODUCTION

Convulsion is an episode where, a person having convulsion, experiences rigidity and uncontrolled muscle spasm or involuntary muscle movements with impaired consciousness. The spasm is erratic and it can last from few seconds to few minutes. It may arise by different physiological changes like deficiency in vitamin (especially vitamin B₆) or sudden, rapid temperature up-down in fever or by epileptic disorder. A convulsion, caused by fever is called febrile convulsion. Febrile convulsion often seen in case of children among age of 6 months to 5 years, when the body temperature exceeds 38°C or 100.4°F [1]. Convulsion can also be caused by seizure.

Seizure is the paroxysmal alteration of neurologic function, caused by excessive, hypersynchronous discharge of neurons in the brain. Among the types of seizures, a tonic clonic seizure, also known as grandmal seizure, is associated with convulsion. GTC seizures (formerly called grand mal) consist of bilateral symmetric convulsive movements (stiffening followed by jerking) of all limbs with impairment in consciousness [2]. Non epileptic convulsion can also be risen due to emotional state, anxiety or psychogenic illness. Besides, some other conditions or disorders, where convulsion occurs are: brain tumor, cardiac arrhythmia, hypoglycemia [3] rabies, eclampsia, uremia, paroxysmal kinesigenic, dyskinesia [4, 5] etc. In medicinal chemistry, different agents [6–14] and heterocyclic rings, especially nitrogen containing heterocycles have great aspects towards drug discovery. Nitrogen containing heterocycles like pyridine, pyrrole, pyrazole, and pyrimidine show broad spectrum of biological activity and are associated with different disease treatment. Pyrazole is a 5 membered heterocyclic ring, containing two nitrogens and three carbons (Figure 1).

In medicinal chemistry, pyrazole and its different derivatives show its significance as a molecule with versatile action as anti-microbial [15], anti-tubercular [16], anti-viral [17], anti-cancer [18], anti-fungal [19], anti-convulsant [20], ACE inhibitor [21] etc.

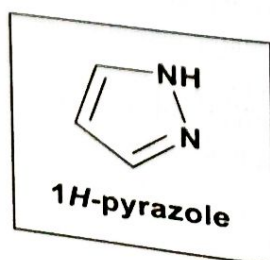


Figure 1. Structure of pyrazole.