

GUANINE

PRODUCT IDENTIFICATION

CAS NO. 73-40-5

EINECS NO. 200-799-8

FORMULA $C_5H_5N_5O$

MOL WT. 151.13

H.S. CODE 2933.59

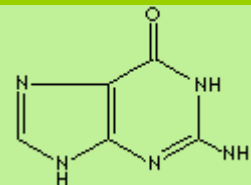
DERIVATION

TOXICITY

SYNONYMS 2-Amino-1,7-dihydro-6H-purin-6-one;

2-Aminohypoxanthine; Guanin; 2-Amino-6-hydroxypurine; 2-amino-6-oxy purine;

CLASSIFICATION



PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE white to off-white crystalline powder

MELTING POINT 360 - 365 C (Decomposes)

BOILING POINT

SPECIFIC GRAVITY

SOLUBILITY IN WATER Insoluble

pH

VAPOR DENSITY

AUTOIGNITION

NFPA RATINGS Health: 1; Flammability: 1; Instability: 0

REFRACTIVE INDEX

FLASH POINT

STABILITY Stable under ordinary conditions

GENERAL DESCRIPTION AND APPLICATIONS

Ribose is a pentose (five-carbon sugar) that is a component of the ribonucleic acid (RNA), where it alternates with phosphate groups to form the 'back-bone' of the RNA polymer and binds to nitrogenous bases. Ribose phosphates are components of the nucleotide coenzymes and are utilized by microorganisms in the synthesis of the amino acid histidine. Its close relative, deoxyribose, is a constituent of deoxyribonucleic acid (DNA), where it alternates with phosphate groups to form the 'back-bone' of the DNA polymer and binds to nitrogenous bases. The presence of deoxyribose instead of ribose is one difference between DNA and RNA. Ribose has one more oxygen atom in its molecule than deoxyribose. Ribose has a five member ring composed of four carbon atoms and one oxygen. Hydroxyl groups are attached to three of the carbons. The other carbon and a hydroxyl group are attached to one of the carbon atoms adjacent to the oxygen. In deoxyribose, the carbon furthest from the attached carbon is stripped of the oxygen atom in what would be a hydroxyl group in ribose. The sugar (ribose or deoxyribose) molecules in the nucleic acid are all oriented in the same direction. Their carbon atoms are numbered: the 5' carbon atom is always on the side of the sugar molecule that faces the leading end, while the 3' carbon atom always faces the tail end. Nucleotide is the structural unit of a nucleic acid. A nucleotide consists of either a nitrogenous heterocyclic base (purine or pyrimidine), a pentose sugar (ribose or deoxyribose) and a phosphate group attached at the 5' position on the sugar. A nucleoside consists of only a pentose sugar linked to a purine or pyrimidine base, without a phosphate group. Purine bases are Adenine, Guanine and Hypoxanthine (examples of purine nucleosides are Adenosine, 2'-Deoxyadenosine, Guanosine, 2'-Deoxyguanosine, Inosine, 2'-Deoxyinosine). Pyrimidine bases are Cytosine, Thymine, and Uracil (examples of pyrimidine nucleosides are Cytidine, 2'-Deoxyguanosine, 5-Methyluridine, 2'-Deoxy-5-Methyluridine, Uridine, 2'-Deoxyuridine). The nucleoside derivatives are involved in important

functions in cellular metabolism and are used to synthesize enzyme inhibitors, antiviral agents, and anticancer agents.

Guanosine: a purine nucleoside composed of guanine linked by its N9 nitrogen to the C1 carbon of ribose. It is a component of ribonucleic acid and its nucleotides (GMP, GDP, GTP, cGMP) play important roles in biochemical processes such as synthesis of nucleic acids and proteins, photosynthesis, muscle contraction and intracellular signal transduction (cGMP). GMP, GDP, GTP are three interconvertible compounds in which Guanosine is attached through its ribose group to one (monophosphate), two (diphosphate), and three (triphosphate) phosphoric acid molecules. Symbol G. Deoxyguanosine: a purine nucleoside, guanine linked by its N9 nitrogen to the C1 carbon of deoxyribose.

- Guanine: a pyrimidine base
- Guanosine Triphosphate (GTP) : a nucleotide composed of guanine, the sugar ribose, and three phosphate groups; the source of the guanosine found in RNA and also involved in many cellular processes, including microtubule assembly, protein synthesis, and cell signaling, due to the energy it releases upon removal of its terminal phosphate group (yielding GDP). The ratio of GTP to ATP is maintained by the reversible transfer of phosphate catalyzed by GDP kinase.
- Guanosine diphosphate (GDP) : a nucleotide composed of pyrophosphate of guanosine which serves as a carrier for mannose residues in glycoprotein synthesis and as a substrate for a phosphorylation reaction of the tricarboxylic acid cycle.
- Guanosine monophosphate (GMP, also known as guanylic acid) : a nucleotide composed of pyrophosphate of guanosine which is formed during the hydrolysis of nucleic acids and is a regulator of pyrimidine nucleotide biosynthesis.
- Cyclic guanosine monophosphate (cGMP); 3',5'-cyclic ester of guanosine monophosphate that serves as an intracellular secondary messenger involved in its direct effects on Na⁺ and Ca²⁺ channels in the plasma membrane of rod cells. Its action is similar to that of cyclic adenosine monophosphate, but the two cyclic nucleotides activate different protein kinases and usually produce opposite effects on cell function. cGMP acts as an antagonist to cAMP.
- Deoxyguanosine diphosphate (dGDP) : a nucleotide, 5'-pyrophosphate of deoxyguanosine.
- Deoxyguanosine monophosphate (dGMP) : a nucleotide, the 5'-phosphate of deoxyguanosine, occurring in deoxyribonucleic acid.
- Deoxyguanosine monophosphate (dGTP) : a nucleotide, the 5'-triphosphate of deoxyguanosine; the source of the deoxyguanosine in DNA

Chemically modified nucleotides substituted or attached by special chemical groups or elements are studied and used to inactivate the normal biological operation in the living organism, the function of important enzymes, and cytobiology research.

SALES SPECIFICATION

APPEARANCE	white to off-white crystalline powder
ASSAY	99.0% min
MELTING POINT	360 - 365 C

TRANSPORTATION

PACKING	
HAZARD CLASS	Not regulated
UN NO.	

OTHER INFORMATION

Hazard Symbols: XI , Risk Phrases: 36/37/38, Safety Phrases: 24/25-26-36

GENERAL DESCRIPTION OF PURINE

Purine is a heterocyclic compound featured by a fused pyrimidine and imidazole rings composed of carbon and nitrogen atoms. The simplest one is purine itself and the two major purines are adenine(6-Aminopurine) and guanine(2-Amino-6-hydroxypurine) which are two bases components of nucleic acid and the nucleotides. Purine itself is not found in nature, but as substituted purines such as methylated, hydroxyl and amino substituted. In addition to adenine and guanine, a group of chemical compounds called purine base include hypoxanthine (6-oxypurine), xanthine (2,6-dioxypurine), uric acid (2,6,8-trioxypurine), and theobromine (3,7-dimethyl xanthine). Theophylline and caffeine are a member of methylated purine family. Purines are biologically important in In medicine and biological research.