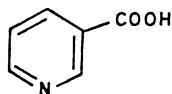


Brand Names : Nicotinic acid; P.P. factor; Pellagra preventive factor; Antipellagra vitamin; Nicacid; Nicagin; Nicobid; Niconacid; Nico-span; Nicotene; Nicotinipca; Nicyl; Akotin; Daskil; Tinic; Nicolar; Wampocap.

Nicotine occurs in minute amounts in all living cells; appreciable amounts are found in liver, yeast, milk, adrenal glands, white meat, alfalfa, legumes, whole cereals, corn, etc. Whole wheat flour contains about 60 $\mu\text{g/g}$ of nicotinic acid. It can be prepared by oxidation of nicotine with nitric acid or by oxidation of β -substituted pyridines. Nicotinic acid, m.p. 236-237°, is a white, odourless, crystalline powder. It is nonhygroscopic and stable in air; sublimes without decomposition. It is freely soluble in water; soluble in hot alcohol and in dilute aqueous solution of alkali hydroxides and carbonates; very slightly soluble in chloroform; practically insoluble in ether. It is stored in well-closed containers and protected from light.



Official

Nicotinic Acid, B.P., I.P.

Nicotinic Acid Tablets, B.P., U.S.P., I.P.

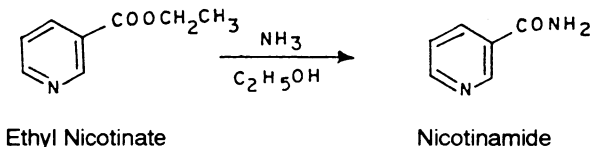
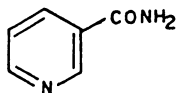
Niacin Injection, U.S.P.

NICOTINAMIDE

Nomenclature : 3-Pyridinecarboxylic acid amide; Pyridine-3-carboxamide.

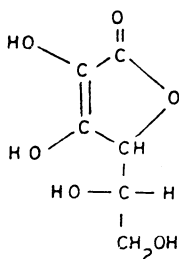
Brand Names : Niacinamide; Nicotinic acid amide; Nicotyl amide; Vitamin PP. Nicamindon; Nicotilamide; Pelonin amide; Benicol; Aminicotin; Vi-Nicotyl; Dipeglyl; Amide PP; Nicofort; Niozymin; Pelmine.

Nicotinamide is prepared by the amidation of esters of nicotinic acid or by passing ammonia gas into nicotinic acid at 320° C.



Lemascorb; Ciamin; Hybrin; Vitacee; Cantan; Catavin C; Celin; Cenetone; Cescorbat; Cereon; Cergona; Cetamican; Cetamid; Planavit C; Colascor; Concemin; Duoscorb; Scorbacid; Davitamon C; Proscorbin; Redoxon; Scrobu-C; Ribena; Vicelat; Vitacin; Vitacimin; Vitascorbol; Xitix; Cevitan; Laroscorbine.

Ascorbic acid is widely distributed in the plants and animal kingdom. Good sources are citrus fruits, hip berries, acerola, fresh tea leaves, peppers, paprikas, tomatoes, rose hips, blackberries, green English walnuts, West Indian cherries and other sources. It is formed rapidly in germinating seeds and apparently reaches a high concentration in rapidly growing stem or root tips, green leaves and seeds.

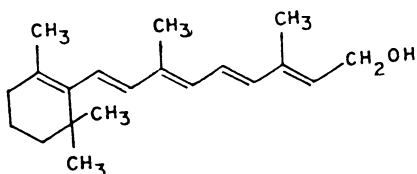


Although ascorbic acid occurs in relatively large quantities in some plants, fruits and other natural sources, its isolation is tedious, and difficult. Ascorbic acid is now manufactured from D-glucose via microbiological oxidation to a keto-acid, which is catalytically reduced to L-idonic acid. This is converted to 2-oxo-L-gulonic acid in the presence of bacteria which is esterified with methanol. The ester is then isomerized and cyclized to L-ascorbic acid.

The natural ascorbic acid is of L-series, though it is dextro-rotatory. It undergoes reversible oxidation and reduction in the organism which owe its antiscorbutic activity. Its name ascorbic acid was given because it exhibited acid properties (sour taste) and would cure scurvy. The enolic group imparts acidity to the molecule and it can form salts. Vitamin C shows marked reducing properties but it does not produce colour with Schiffs base. It is quantitatively oxidized in aqueous solution by iodine or by 2,6-dichlorophenolindophenol and the oxidation process is reversible. Ascorbic acid is the least stable of all vitamins.

Ascorbic acid, m.p. 190-192°, occurs as odourless, colourless or slightly yellow crystals or crystalline powder with pleasant, sharp acidic taste. It is soluble in water and alcohol; practically insoluble in chloroform, benzene, oils, fats, ether and petrol. It is stable in air when dried. In impure preparations and in many natural products the vitamin oxidizes on exposure to air and light. It possesses relatively strong reducing power, and decolourizes many dyes. Aqueous solutions are rapidly oxidized by air and the reaction is accelerated by alkalis, iron and copper. It produces colour with ferric chloride and precipitated with basic lead acetate. It is kept in well-closed containers and protected from light.

Vitamin A occurs in the animal organism and not in plants. Carotenoids are converted into vitamin A by the liver. It is extracted from fish liver oils where it occurs mostly in esterified form.



A suitable form of retinol (vitamin A alcohol) consists of esters of edible fatty acids, principally acetic and palmitic acid. It is a light yellow to red oil which may solidify on cooling. It is practically odourless or with a mild fishy odour, but no rancid odour or taste.

Pure vitamin A, m.p. 62-64°, occurs as pale yellow plates or crystals and is insoluble in water but soluble in alcohol, fixed oils and usual organic solvents. It is unstable in the presence of light and oxygen and in oxidized fats and oils. Ultraviolet light inactivates vitamin A and its solutions which exhibit a characteristic green fluorescence. The free alcohol is sensitive to air-oxidation, but oil solutions of it are quite stable. Esters of vitamin A are more stable to oxidation. In solid form, it may be dispersible in water. The vitamin is stored in airtight containers and protected from light.

Uses : Vitamin A is essential for growth, for the development and maintenance of epithelial tissues, and for vision. Its deficiency causes night blindness and changes in the skin and mucous membranes. Vitamin A is used to treat night blindness and skin disorders including acne and psoriasis.

Intake of excessive amounts of vitamin A leads toxicity, known as hypervitaminosis which is characterized by fatigue, irritability, anorexia, loss of weight, vomiting and other gastrointestinal disorders, fever, skin changes, alopecia, dry hair, cracking and bleeding of lips, anaemia, headache, pain in bones and joints, etc.

Official

Vitamin A Capsules, U.S.P.

Cod-liver Oil, B.P.

Concentrated Vitamin A Solution, I. P.

Concentrated Vitamin A and D Solution, I.P.

Halibut-oil, B.P.

Shark-liver oil, I.P.

Vitamin E Capsules, U.S.P.

Vitamin E Preparation, U.S.P.

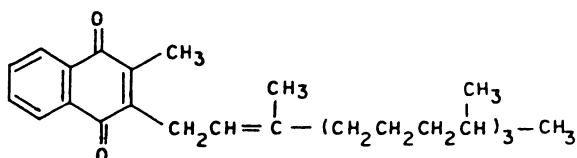
VITAMIN K

The term vitamin K is used for a range of naphthoquinone compounds which are necessary for the biosynthesis of blood clotting factors. These include acetomenaphthone, menadiol, menadione, menatetrene and phytomenadione.

VITAMIN K₁

Nomenclature : 2-Methyl-3-(3,7,11,15-tetramethyl-2-hexadecenyl) -1,4-naphthalenedione.

Brand Names : 3-Phytylmenadione; Phytomenadione; Phytionadione; Phylloquinone; Antihemorrhagic vitamin; K-ject; Konaktion; Mephyton; Mono-kay.



Vitamin K₁ occurs naturally as the *trans* isomer. It was first isolated from alfalfa and is widely distributed in higher green plants. It is a clear, deep yellow to amber, very viscous, odourless oil which is stable in air but decomposes on exposure to light.

It is practically insoluble in water; soluble in alcohol, freely soluble in chloroform, ether, and fixed oil. Vitamin K₁ is stable to air and moisture, but decomposed in sunlight. It is unaffected by dilute acids, but is destroyed by solutions of alkali hydroxides and by reducing agents.

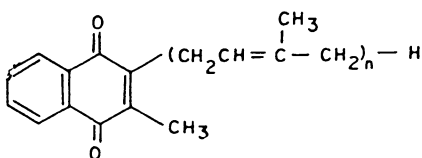
It is stored in airtight containers and protected from light.

VITAMIN K₂

Nomenclature : 2-Methyl-3-*all trans*-polyprenyl-1,4-naphthoquinones.

Brand Names : Menaquinones.

Vitamin K₂ are antihæmorrhagic vitamins possessing



CONTENTS

<i>Preface</i>	<i>v</i>
1. Introduction	1
2. Classification and Nomenclature	4
3. Stability and Storage Conditions	12
4. Antiseptics and Disinfectants	19
5. Sulphonamides	34
6. Antileprotic Drugs	46
7. Anti-tubercular Drugs	52
8. Antiamoebic and Anthelmintic Drugs	66
9. Antibiotics	81
10. Antifungal Agents	126
11. Antimalarial Drugs	134
12. Tranquillizers	150
13. Hypnotics	165
14. General Anaesthetics	178
15. Local Anaesthetics	187
16. Antidepressant Drugs.	195
17. Analeptics	202
18. Adrenergic Drugs	208
19. Adrenergic Antagonists	218
20. Cholinergic Drugs.	221
21. Cholinergic Antagonists	229

viii Contents

22. Diuretic Drugs	237
23. Cardiovascular Drugs	245
24. Hypoglycemic Agents	252
25. Coagulants and Anti-coagulants	261
26. Histamine and Anti-Histaminic Agents	269
27. Analgesics and Antipyretics	280
28. Nonsteroidal Anti-inflammatory Agents	294
29. Thyroxine and Antithyroids	299
30. Diagnostic Agents	305
31. Anticonvulsant Drugs	314
32. Cardiac Glycosides	329
33. Anti-arrhythmic Drugs	337
34. Anti-hypertensive Agents	341
35. Vitamins	350
36. Steroidal Drugs.	372
37. Antineoplastic Agents	387
<i>Glossary of Medical terms</i>	399
<i>Examination Question Papers</i>	427
<i>Index</i>	469