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Exploration of 5 -ASA

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ABSTRACT

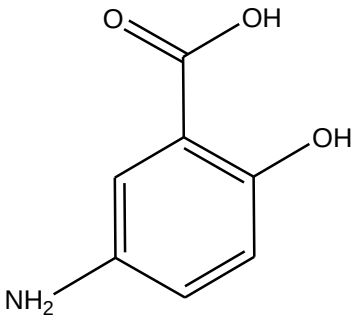
5-amino- 2-hydroxyl benzoic acid (5-ASA) is also known as Mesalamine is very important molecule for human being. This molecule has several important bio chemical functions to play. This molecule has amino (-NH_2 group), Carboxylic (-COOH group) and phenolic hydroxyl (-OH group). Elemental data, IR – spectra, Proton and 13C NMR spectra of 5 -ASA are here. This molecule has water solubility and capability to perform biochemical functions. Further Amino, Carboxylic and phenolic hydroxyl unit has tremendous ability to form Metal Chelates with 3d ,4d and 5d metal ions that are biologically active.

Keywords : 5 – Amino Salicylic Acid, Physical Data.

I. INTRODUCTION

5 -amino salicylic acid bear an important role in Analytical, biological and electrochemistry. A most important bimolecular are known now a day with drastically different properties required for various application. Metal chelates of biologically important molecules are also being investigated for various requirement of human life. Organic molecules with donor (N, O) atoms are very good examples that can form coordination complex compounds. They show important biologically or chemically properties.

II. STRUCTURE AND PROPERTIES



CAS :5-Amino-2-hydroxybenzoic acid
Additional Names:5-amino salicylic acid; 5-amino-2-hydroxybenzene-1-Carboxy
-lic acid; m-amino salicylic acid; fisalamine; mesalamine,
5-ASA
Trademarks: Asacol (Tillotts); Asacolitin (Tillotts); Claversal (Merckle);

Lixacol (Schering-Plough); Mesasal (Sanofi-Synthelabo);
Pentasa (Ferring), Rowasa (Solvay), Salofalk (Falk).
Molecular Formula: $C_7H_7NO_3$
Molecular Weight: 153.14 gm
Percent Composition: C = 54.90%, H = 4.61%, N = 9.15%, O = 31.34%
Properties: White to pinkish crystals, dec-280°. Slightly sol in cold water, alcohol and
more soluble in hot water, soluble in HCl.
USE: In manufacturing of light-sensitive paper, azo and sulfur dyes.
Therapy-Cat: Anti-inflammatory (gastrointestinal).

III. SPECTRAL DATA

ELEMENTAL COMPOSITION: C = 54.90%, H = 4.61%, N = 9.15%, O = 31.34%

^{1}H-NMR: δ =8.585 (Singlet 1H, - COOH), δ =8.077(Singlet 1H, -OH), δ = 2.412 (Singlet, 2H, (-NH_2) Primary amine), δ = 6.431 – 7.531 (Multiple 6H, AR – H),
IR Spectra: (KBr) 3100 cm^{-1} (N-H), 3160 cm^{-1} (O-H), 2850 cm^{-1} (C-H), 1650 cm^{-1} (C=O),
1370 - 1600 cm^{-1} (C=C & C-N)
^{13}C-NMR: (Solvent $CDCl_3$) δ = 176.05 (-COOH), δ = 112.10 – 138.27 (AR – C), and δ =
170.01 (-C=O)

BIO-CHEMICAL AND MEDICINAL IMPORTANT:

5-Amino salicylic acid is a drug used for treating ulcerative colitis. The exact mechanism is not known but is believed to be by reducing inflammation in the colon.
Ulcerative colitis and other inflammatory diseases cause excessive production of chemicals, for example, prostaglandins, that produce inflammation in the colon.
Prostaglandins are produced by the enzymes, cyclooxygenase and lipoxygenase. These enzymes are over-active in individuals with ulcerative colitis.
5-Amino salicylic acid may work by blocking the activity of cyclooxygenase and lipoxygenase, thereby, reducing the production of prostaglandins. Reduced production of prostaglandins decreases inflammation in the colon and the symptoms associated with ulcerative colitis.
It is used for the treatment of mild to moderately severe ulcerative colitis.
The suppositories are limited to use in ulcerative colitis involving only the rectum (proctitis) and the enemas to colitis involving only the part of the colon close to the rectum (distal colitis) or proctitis.
While the benefits of Mesalamine can be seen within 3 to 21 days of starting therapy, it may take up to three to six weeks for the enemas and suppositories, six weeks for the tablets, and eight weeks for the capsules to have maximum effect.
5-Amino salicylic acid formulations are associated with several drug interactions. Combining 5-ASA with drugs that affect kidney function, for example, nonsteroidal anti -inflammatory drugs (NSAIDs) or ibuprofen may increase the likelihood of reduced function of the kidneys.
Concurrent use of 5-ASA and 6-mercaptopurine or azathioprine (Imuran) may increase the likelihood of disorders of the blood cells, particularly reduced numbers of cells.
5-ASA may increase the blood thinning effect of warfarin (Coumadin). There are no adequate human studies of Mesalamine during pregnancy. 5ASA is known to cross the placenta into the fetus, but animal studies revealed no evidence of harm to the fetus. 5-ASA is excreted in breast milk.
5-ASA should only be used by nursing mothers if it is felt that the benefit of its use justifies the potential but unknown risk to the infant.
The most common side effects of 5-ASA are headache and flatulence. Hair loss and itching also may occur. Infrequent side effects include increased heart rate, acne, pancreatitis, back pain, fatigue, tremor, ear pain, and blood disorders.

Kidney dysfunction has been associated with 5-ASA. Kidney function should be evaluated prior to and periodically during 5-ASA therapy.

5-ASA may cause an acute intolerance syndrome that resembles a flare of inflammatory bowel disease (Crohn's disease or ulcerative colitis) with cramping, abdominal pain, and bloody diarrhea. Fever, headache, itching, and rash also may occur. Symptoms usually subside once 5-ASA is discontinued.

Since 5-ASA is related to aspirin in structure, individuals who are allergic to aspirin should not take Mesalamine. Flu-like symptoms, vomiting, nausea, dizziness, weakness, headache. constipation, abdominal/back pain, upset stomach, diarrhea, or gas may occur.

This medication is used to treat ulcerative colitis, a type of bowel disease. It does not cure ulcerative colitis, but it may decrease symptoms such as stomach pain, diarrhea, and rectal bleeding caused by irritation/swelling in the colon/rectum.

5-ASA is an amino salicylate anti-inflammatory drug. This medication may also be used to treat Crohn's disease.

Before taking this medication, tell your doctor or pharmacist if you are allergic to it; or to other medications that are broken down into 5-ASA (e.g., sulfasalazine, olsalazine); or to salicylates (e.g., aspirin); or if you have any other allergies.

Before using this medication, tell your doctor or pharmacist your medical history, especially of: kidney problems, liver problems, asthma, abnormal emptying of stomach contents into the intestine (pyloric stenosis), pancreas problems (pancreatitis), inflammation

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