

PATENT SPECIFICATION
NO DRAWINGS

898.335



Date of Application and filing Complete Specification Aug. 22, 1958.
No. 1737/62.

Application made in Japan (No. 23598) on Sept. 27, 1957.

Application made in Japan (No. 11586) on April 28, 1958.

(Divided out of No. 898,334).

Complete Specification Published June 6, 1962.

Index at acceptance:—Classes 49, B1(F:L:M:T), B6(A:G); and 14(2), A2, E6(C2:D).

International Classification:—A23b, I. A23h. C12j.

COMPLETE SPECIFICATION

Application of 5'-Nucleotides

I.C.

We, YAMASA SHOYU KABUSHIKI KAISHA, a Corporation organized under the Laws of Japan, of No. 550, Arai 2-chome, Choshishi, Chibaken, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a process for improving the flavour of foods, beverages and seasonings containing amino acids or other organic acids and this subject matter is divided out from our co-pending Application No. 27079/58 (Serial No. 898,334).

According to the invention a process for improving the flavour of foods, beverages and seasonings containing amino acids or other organic acids comprises adding to the said food product one or more free 5'-nucleotides or one or more alkali metal salts of said 5'-nucleotides.

The invention is based on the discovery that synergy exists between 5'-nucleotides and amino acids or other organic acids.

According to our discovery, purine and pyrimidine bases, their nucleotides, and their 2'- and 3'-nucleotides have little flavour, while 5'-nucleotides, especially inosine-5'-monophosphate, guanosine-5'-monophosphate, and xanthosine-5'-monophosphate, have a very agreeable good taste. Furthermore, there is specific synergy in taste between 5'-nucleotides and amino acids or other organic acids. Among various amino acids, glutamic and aspartic acids were recognised to be especially effective in the synergy with 5'-nucleotides. Conventional foods, beverages, and seasonings contain a considerable quantity of amino acids or other organic acids as main flavouring components, but scarcely any 5'-nucleotides. Therefore, it seems that the role of 5'-nucleotides in flavouring is very important. For example the good taste of soups or meat extracts, containing a small

quantity of 5'-nucleotides, may perhaps be caused mainly by the synergy between 5'-nucleotides and amino acids.

In carrying out the invention the 5'-nucleotide or its alkali metal salt may be added to food products such as meat products, soups, vinegar, various dressings, sauces, curry powder and various drinks including wine and in this way any unpleasant pungency which spoils the taste of foods or beverages is counteracted and apart from this the synergy between 5'-nucleotides and the amino acids or organic acids enhances or increases the flavour.

In the case of foods, beverages or seasonings which contain no amino acids the invention is more effective if monosodium glutamate is added along with the 5'-nucleotide.

The bitter substances in the crude preparations of 5'-nucleotides can be readily removed by a cation exchange resin but both crude and purified preparations are useful. There is no significant difference between the flavouring action of the free 5'-nucleotides and their alkali metal salts.

EXAMPLE 1

100—500 mg. of a crude mixture of adenosine-5'-monophosphate, guanosine-5'-monophosphate, cytidine-5'-monophosphate, and uridine-5'-monophosphate was obtained as follows (the percentages indicated are on a weight basis):—

50 ml. of an aqueous culture medium containing 5% glucose, 0.5% casein, partially digested with enzymes from pancreas, 0.05% monobasic potassium phosphate, 0.05% of dibasic potassium phosphate, 0.04% of magnesium sulphate and 0.04% of calcium chloride was sterilised and inoculated with a pure culture of *Penicillium citrinum*. The inoculated growth medium was shaken on a reciprocating shaker at 30° C. for a period of seven days in order to supply the neces-

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sary oxygen. After seven days culture the filtrates were concentrated *in vacuo* and then dried against running water overnight. To the dialysed solution four volumes of ethanol were added. The resulting precipitate which was rich in 5'-phosphodiesterase activity, was dehydrated in a desiccator and was employed as an enzyme preparation. 1 gram of this preparation was incubated with 200 ml. of 5% by weight ribonucleic acid at 65° C. and pH 5.0. Under these conditions 5'-phosphodiesterase was recognised to be very active. The crude mixture was added to 1 litre of sauce. In practice 2—10 ml. of reaction mixture were employed against 1 litre of sauce. By this treatment unpleasant pungency of the sauce was counteracted perfectly, and the good flavour was greatly increased. Thus the sauce became flavoured almost beyond recognition. The mixture of 5'-nucleotides could be kept in the form of dry powder for a long time.

EXAMPLE 2

Monosodium glutamate was coated with purified inosine-5'-monophosphate disodium salt or guanosine-5'-monophosphate. The ratio of monosodium glutamate to inosine-5'-monophosphate disodium salt or guanosine-5'-monophosphate was 5—15:1. The resultant superior seasoning was recognised to have remarkable flavouring properties for all kind of dishes.

EXAMPLE 3

To 120 g. of soup potage powder (corresponding to 1800 ml. of final volume) 1 to 2

g. of purified inosine-5'-monophosphate disodium salt or guanosine-5'-monophosphate were added. From the resultant enriched powder, a soup was prepared with a remarkably improved flavour. Instead of the purified nucleotide preparations the crude preparation of mixture of 5'-nucleotides, without isolation of the nucleotides, could be employed satisfactorily as shown in Example 1.

WHAT WE CLAIM IS:—

1. A process for improving the flavour of foods, beverages and seasonings containing amino acids or other organic acids, which process comprises adding to the said food product one or more 5'-nucleotides or one or more alkali metal salts of said 5'-nucleotides.

2. A modification of the process claimed in Claim 1, wherein when treating foods, beverages or seasonings which contain no amino acids there is also added monosodium glutamate.

3. A process as claimed in Claim 1 or Claim 2, wherein the 5'-nucleotide is purified by ion exchange with a cation exchange resin.

4. A process for improving the flavour of foods, beverages and seasonings substantially as described in any one of the specific examples herein.

For the Applicants:

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Leamington Spa: Printed for Her Majesty's Stationery Office by the Courier Press.—1962.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained.

ERRATA

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THE PATENT OFFICE
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