식품첨가 사용을 위한 목초액으로부터의 메탄올 분리

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Removing Methanol from Pyroligneous Liquid to Use as Food Additive

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Introduction

Pyroligneous liquid has flourished human life in various fields for a long periond. For example, it has long been used as food additive for the sterilization, longer conservation and superoxidation of foods in western. It has been also a lot used to remove or reduce stench.

However, any preceeding scientific study on pyroligneous liquid has not been made so far to find out the principle of those advantages on our lives. Recently the use of pyroligneous liquid has been even varied, such as medication for atopic dermatitis and deodorizer of landfill. Accordingly the study on pyroligneous liquid has been just begun.

To use this liquid for food additive, ingredients of it have been checked in the basis of past research. As a result, the amounts of methanol and carbonyl are not complied with the standards presented by Korea Food and Drug Administration (KFDA) for the use as a food additive.

The design of this experiment has been focused on controlling acidity and amounts of methanol and carbonyl to use it as a food additive. The main purpose is to reduce the methanol because the amount of methanol in pyroligneous liquid used at this experiment exceeds its standard over 1400%.

By mixing the pyroligneous liquid and water and distilling it, methanol is to be evaporated with water. After several experiments, it is confirmed that the proportion of pyroligenous liquid and water effects not only the amounts of methanol but also acidity and the amount of carbonyl. The primary purpose of this experiment is to optimize the proportion of mixed solution.

Hypothesis

The simple distillation is not effective to reduce methyl alcohol since the pyroligneous liquid contains 700ppm or 0.07% of methyl alcohol only. Also, chemical process to decrease methyl alcohol has a possibility to increase the amount of carbonyl over the standard of KFDA.

In this experiment, water have been added to the pyroligneous liquid before the distillation on the assumption that adding water would be more helpful to carry the methyl alcohol from the pyroligneous liquid.

Procedures

Varying the ratio of water and pyroligneous liquid in a certain amount of total volume, samples of different ratio are prepared to be distilled. Distillating conditions including time, temperature, pressure as well as the ratio and the total volume are to be recorded. The amount of residue after a distillation must be recorded, and the residue are to be stored in vials. The amounts of methyl alcohol and carbonyl are to be checked with GC and UV each. After finding the optimum distilling condition from data obtained through above procedure, the design of a bigger scale process is to be made.

Conclusions

From the result of component analysis of pyroligneous liquid, it is clearly known that every single item complies with the standards of KFDA but methyl alcohol. It is possible to reduce methyl alcohol through the process when water is added to pyroligneous liquid and the mixing liquid is heated. It is surely deduced that it must have the optimum ratio, which means less than 50 ppm methanol is contained in the liquid and the process does not require big money.

The purpose of the study on pyroligneous liquid is not only for a food additive. It could be also made as a food itself or a deodorant. To use it as a food, it must be processed to comply with more strict standards for a food than for a food additive presented by KFDA. Its order removal effect and the way of removing its own smoky smell will be studied for the use as a deodorant. The study is to discover what kinds of components in pyroligneous

liquid removes stench, and what other components makes its own characteristic smoky smell. As finishing those studies, the design for mass production is to be followed.

Figure and Table

Table 1. The methyl alcohol has been reduced by distillation.

standard	ratio (water : pyroligneous liquid)	methyl alcohol (ppm)
under 50ppm	5:1	0.80
	2:1	2.10
	1:1	5.48
	2:3	37.5
	1:3	76.0

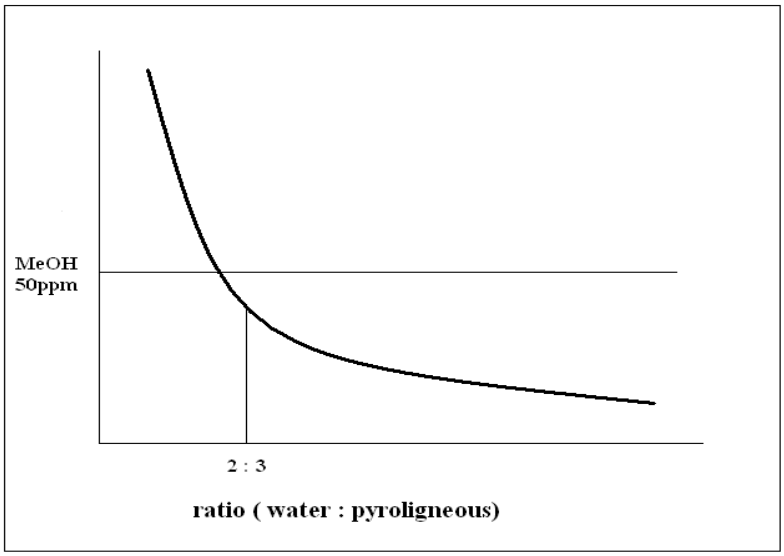

Figure 1. The optimum ratio is able to be obtained by completing the deduced graph with further experiments.

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