

STATUS AND PRODUCTION OF EDIBLE MAGNESIUM CHLORIDE IN CHINA

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Food safety has always been the root of people's lives, and is related to people's health and safety, which also lays foundation for national stability and is the prerequisite for social development. In China's national economy, the food industry has become the largest industry. In accordance with the relevant data, China's food industry output increased from 662.2 billion to 4000 billion from 2000 to 2008, with an average annual increase of 25%, accounting for 13% of GNP. However, there still are some gap in the food safety and food regulation, accidents in food safety occurred occasionally, which raised more concern about the safety of food in society, and also attracts the government's concern, the issue of food safety has risen to a high degree of national public safety problem. The government has continually intensified the supervision of food safety, China's State Food and Drug Administration formally listed on April 16, 2003, State Council promulgated the "special provisions on strengthening food safety supervision and management by State Council" at July 26, 2007, the State Council set up "Food Safety Commission" early in 2009, the seventh meeting of the Standing Committee of the Eleventh National People's Congress adopted "China's food safety law" on February 28, 2009, which marks China's food safety, food supervision and management entered a new stage.

As a kind of food additive, the production standard of edible magnesium chloride was promulgated by National Development and Reform Commission on May 1st, 2004.

1. CONTROLLING POINT ON PRODUCTION OF EDIBLE MAGNESIUM CHLORIDE

Edible magnesium chloride is mainly used as a coagulant in soybean production, differs from industrial magnesium chloride, the controlling points on the production are as follows:

Controlling the raw materials, the raw materials are from the Qinghai salt lake, belongs to natural crystalline magnesium, rather than chose the crystalline magnesium from the brine as a byproduct of the production of potassium, which may avoid the intervene of ammonium. The brine was taken from the solution after producing carnallite, and then was used to produce crystalline magnesium, which is just the raw material of producing edible magnesium chloride. The period of such process had to experience the winter, when the calcium and sulfate may be removed from the solution to ensure the quality of raw material.

In the process, we should strictly limited the poisonous element:
 $Pb \leq 3ppm, As \leq 0.5PPM$,
 $NH_4^+ \leq 50PPM$, no additives, no defoamer,

and any other poisonous element

Strictly control the temperature during the production, in the negative pressure evaporation, the temperature should be 135°C, in the atmospheric evaporation, the temperature should be 155°C, if the temperature is higher than the above mentioned values, the magnesium chloride will produce fission, the new oxides may formed.

Requirement of the appearance of edible magnesium chloride is white, with brightness is equal or less than 40 degrees, indicating that the production process doesn't mixed with any organic matter and insoluble matter. Even more, the production process also has to go through sediment filtration and further purification, thus the magnesium chloride has a high degree of transparency. the pass rate of final product is more than 99.5%, which ensure all indicators are in line with national standards of edible magnesium chloride as a safe food additive.

2 , INDUSTRIAL MAGNESIUM CHLORIDE CANNOT BE USED AS COAGULANT IN SOYA PRODUCTION.

1. Industrial magnesium chloride has no strict control on heavy metal, poisonous elements, cannot be used as coagulant in soya production, in the production process of industrial magnesium chloride, firstly potassium chloride was extracted, and then to produce magnesium chloride. In the process of extracting potassium chloride, defoamer (diesel) was added, which are fatty acids, and Methyl trimethoxysilane, etc., all of those are poisonous to human's health.

2. if bleacher was added to the industrial magnesium chloride in order to obtain a whiter magnesium chloride, the consequence was more dangerous. the main bleacher are potassium chlorate bleach (KClO_3), sodium chlorate (NaClO_3), sodium chlorite (NaClO_2), slaked lime ($\text{Ca}(\text{OH})_2$), these substances can react with organic compounds to generate benzotrichloride. Benzotrichloride will take effect on central nervous system, and cause

damage in heart, liver, kidney. IARC carcinogenicity Comments that it may cause cancer of human.

3. Industrial magnesium chloride take the brine after producing salt as raw materials salt, which contains more organic matter, processed under high temperature carbonization will generate impurities and appeared brown, which is not suitable for human consumption.

3. STATUS AND PRODUCTION OF EDIBLE MAGNESIUM CHLORIDE IN CHINA

China has a unique advantage in resources.

the raw materials of producing edible magnesium chloride are mainly come from Qinghai Lake, located in Chaidamu Basin in Qinghai-Tibet Plateau, which is the only potassium fertilizer production base in China, according to the statistics calculated, the output of potassium fertilizer can provide millions of tons of natural pollution-free crystalline of magnesium chloride annually. It can ensure the need of producing edible magnesium chloride for China, and also can export to other countries around the world.

Production capability of edible magnesium chloride in china

Since May 1, 2004, the Chinese Government promulgated the standards of edible magnesium chloride, six manufactures on producing edible magnesium chloride was set up afterward, which distributed in North China, Central China, Northwest, Southern Liaoning and other places with an annual total production capacity of 100,000 tons, it can meet the market demand of China's soybean industry.

4. DEVELOPMENT PROSPECTIVE ON THE MARKET OF EDIBLE MAGNESIUM CHLORIDE

Along with the development of soy industry, the demand for edible magnesium chloride increases year by year. Protein

content in Soybean is about 40%, including 14 kinds of amino acids, 8 kinds of which is necessary for human's health, and is the body's main source of vegetable protein. The healthy function of soy products is being accepted by more and more people. The types of soy products increase much a lot in recent years and among vegetables and staple foods. Their price is lower than other food and vegetables. As a result, the yield of soy product in china increased continually, calculating based on the consumption of soybean in 2009, the annual consumption of soybean is about four million tons, and this figure is seven times of that of the early stage of reform and opening up in 1978 with a consumption of 600,000 tons. Driven by the soybean market, the market of edible magnesium chloride market grows year on year. In 2008, China's consumption of edible magnesium chloride is about 20,000 tons.

In addition, as the people's living standard improves, the requirement for the quality of soy products have become increasingly demanding. China's soybean market used edible magnesium chloride as the coagulant, at the same time, edible calcium sulfate (gypsum) also was used as the coagulant, and the total market share is more than 50%, the market mainly distributed in rural areas and small towns where the economy is relatively lower.

Soy products made from edible magnesium chloride have special qualities such as bean aroma, delicate taste, pure flavor without miscellaneous. Large developed cities as Beijing, Shanghai and Shenzhen and the northern people preferred to eat brine Tofu

However, The output of brine Tofu is low, every kilogram of soy beans can produce 3.3-3.5 kg brine Tofu, but can produce 4.0-4.5 kg gypsum tofu, 1kg more than brine tofu, whereas the flavor is not as good as brine tofu, and also have high content of calcium, which can be easily precipitated in the body, a long-term consumption will cause calculus, such countries as Japan and European has stopped to eat such food.

To this end, with the understanding of

people's living standards and the improvement of the soybean market in the next brine tofu will be a gradual replacement of gypsum.

With the improments of people's living standards and conscious of food safety, the soybean market of brine tofu will gradually replace that of gypsum tofu .

5.EXPORT OF MAGNESIUM CHLORIDE IN CHINA.

Qinghai Salt Lake has an advantage in resource of magnesium chloride, both its quality and capacity can be guaranteed, and ranks top in the world. In addition it is the world's only natural resources of magnesium chloride except for the Dead sea in Israel. At present, the crystalline magnesium and edible magnesium chloride of Qinghai Salt Lake been exported to Japan, Korea, Southeast Asia, North America and other countries. In addition, animal husbandry in New Zealand, Australia imported magnesium chloride from China. The Chinese government, Chinese enterprises are willing to work with all enterprises of magnesium chloride industry round the world in a wide range of technical exchanges and economic cooperation, and to promote the rapid development of magnesium chloride industry, to improve the status and role in the overall economic development and finally to promote mutual development.

6.PROBLEMS AND FUTURE DEVELOPMENT OF EDIBLE MAGNESIUM CHLORIDE IN CHINA

Since the promulgation and implementation of standards on edible magnesium chloride on May 1, 2004, the awareness of soy product enterprises and the consumer improves quite a lot under the supervision and propaganda of the government. Edible magnesium chloride used as food additives has been widely used in soy industry, and achieved obvious results.

However, as the soybean industry has the characteristics of scattering widely, which bring about certain difficulties to the

government supervision especially at some isolated areas, illegal businesses use industrial magnesium chloride instead in order to achieve immediate benefits. In addition, technology in some enterprises producing edible magnesium chloride is outdated, and causes higher cost, public propaganda is also missed, which brought certain negative impact to the soy industry.

Facing such problems in the edible magnesium chloride, first of all, the government should enforce propaganda and intensify supervision and law enforcement. Secondly, the enterprises also have to improve the production capacity and to realize the modernization of production processes, and strive to reduce costs, to strengthen the work of marketing and after-sales service. Finally, the majority of consumers should also play a supervisory role, in this case, the soy industry can develop in a healthy way and ensure food safety.

The promulgation and implementation of "Food safety law of China" indicates that Chinese food safety entered in to the stage of the legal system. The emergence of standard on edible magnesium chloride indicates that management of food additives have further refined and improved. We firmly believe that under the leadership of the government and various sectors of the general community, with the support of the efforts of the industry, edible magnesium chloride made in china will do better than ever, and it dooms to contribute much to chinese and even the world's food industry.