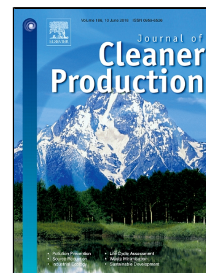


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Cleaner Production of Monosodium Glutamate in China

Liming Dong^{a*}, Yongzhi Li^b, Ping Wang^a, Zhihe Feng^c, Ning Ding^a

^aKey Laboratory of Cleaner Production and Integrated Resource Utilization of China National Light Industry, Beijing Technology and Business University, Beijing 100048, China

^bChina National Light Industry Council, Beijing 100833, China

^cChina Biotech Fermentation Industry Association, Beijing 100833, China

ABSTRACT

Monosodium glutamate (MSG) is frequently used in Chinese cuisine, and China produces approximately 80% of the MSG used worldwide. The MSG industry has long been receiving increased attention from the government and the public because of its wastewater discharges. In this study, a comprehensive review of the MSG industry development from 2005–2015 in China was conducted. The results revealed great progress in **cleaner production (CP)** promotion based on significantly reduced energy and water consumption. Moreover, the findings showed that implementation of the best available techniques (BAT) for pollution prevention by the MSG industry played a key role in these improvements. Indicators of energy and resources consumption and pollution production were also reviewed and their potential for CP was clarified. The influence mechanisms were classified into external and internal factors for CP promotion in the MSG industry, while the external compulsory mechanisms combined with supportive policy had a great influence on CP promotion. It also acted to stimulate concern regarding the environment and encourage research and improved management for the MSG industry. The internal mechanisms driven by external influences have helped the MSG industry make great progress in CP. Moreover, integrated utilization of the tail liquid, unorganized emitted waste gas and excess sludge disposal are still challenges faced by the MSG industry in China.

Keywords: Monosodium glutamate industry; Cleaner production; Best available techniques; Influence mechanism; China

1. Introduction

Since 1908, monosodium glutamate (MSG) has been used worldwide as an additive or seasoning to enhance the flavor of foods (Ault, 2004). The process for isolating MSG from wheat flour was patented by a Japanese chemist. In 1909, the first MSG was produced commercially under the trade name Ajinomoto (at the origin of flavor). The flavor sensation of MSG is often described as “meaty” and has been classified as an “umami” flavor. In addition, MSG also has the ability to enhance the natural flavors of poultry, meats, snacks, seafood, soups and stews (Adeyemo and Farinmade, 2013; Fuke and Shimizu, 1993); thus, it is widely used in the fields of cooking and food processing in the food industry. Monosodium glutamate is the monosodium salt of glutamic acid (GA). Although there has been a great deal of discussion regarding its genotoxic potential to human health (Ataseven et al., 2016;

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