Call for papers / Abstract Submission Confirmation

[Abstract Number:165]
Title of Abstract: The emission rate and size distribution of cooking-oil mists under various frying levels

Dai Yu-Tung 1), Juang Yow-Jer 2), Shiue Cherng-Jyh 3), Du Pei-Lin 3), Chuang Ya-Fan 1)

Department of Occupational Safety and Health, Chang Jung Christian University, Tainan, Taiwan 1), Department of Occupational Safety and Health, Chung Hwa University of Medical Technology, Tainan, Taiwan 2), Taiwan Sakura Corporation 3)

Presentation field: Occupational Hygiene

Keywords: emission rate, cooking-oil mist, size distribution, occupational exposure

Abstract text

The emission rate and consequent exposure concentration as well as the size distribution are important factors for occupational exposure assessment. In this study, the airborne cooking-oil mist characteristics are investigated. The experiment is conducted in the testing room for two levels of frying conditions (high and low). Anderson multi-stages impactor was used to obtain the concentration and size distribution. The emission rate was also determined by integrating the room size.

It was found that the concentrations under different frying levels are 7.99 mg/m$^3$ (high) and 4.45 mg/m$^3$ (low) respectively. The corresponding emission rates are 36.82 mg/min for high level and 1.23 mg/min for low level. According to the measured size distribution, over 99% of airborne cooking-oil mists are smaller than 1.1 micron for both frying levels. As to the mass fraction, over 50% are found that contributed by mists ranging between 0.7 and 1.1 micron for high frying level. For low frying level, mass fractions of all size ranges are about 10% except 0.7 micron which contributed about 20% of total mass.

The following conclusions are obtained from this study. (1) The high frying level yielded higher emission rate and concentration than that of low level frying process. (2) Over 90% of oil mists generated by both frying process are respirable. (3) The mass fraction distribution is obviously different for high and low frying levels. (4) The ventilation device and suitable personal protective equipment are needed to prevent workers from adverse health effect by occupational exposure to frying-oil mists.