Exposure to Formaldehyde during Sterilization in Some Manufactures and Assessing Its Absorption by Zeolites

Rezvan Zendehdel[1], Mojgan Zendehdel[2], Mahmoud Ghazi-Khansari[3], Homa Khiri[1], A Abdoli[2]

ABSTRACT

Background: Formaldehyde is one of the most serious air contaminant that can be found everywhere. Some of the source of formaldehyde include product of building materials, decorated materials, cigarette smoke, etc. Aldehydes compounds especially formaldehyde are used as disinfectants for sterilization in different industries. In this study we measured formaldehyde workplace exposure with NIOSH method in some factories. The NaY zeolite absorption capacity of formaldehyde in different concentration was also assessed.

Method & materials: Samples of workplace airborne formaldehyde vapor were taken from 24 workplaces with 159 exposed workers. Of these samples, 11 workplaces were chosen from pharmaceutical companies, 5 workplaces from detergent manufacturing plants and 4 workplaces from poultry Farm Companies.

Result: The results show the mean concentration of formaldehyde in pharmaceutical companies was 0.769ppm, in detergent manufacturing was 0.558 ppm, and in poultry farm was 0.432ppm. Considering the short-term exposure limit (TLV-Ceiling) the results of the survey indicate that the number of subjects in exposed group (91.7%) was greater than unexposed group (8.3%). In evaluation NaY zeolite for its purification power it maximally absorbed 56.5% from highest concentration (1.5ppm) of formaldehyde after 8 –hours.

Conclusion: Since the inhalation of formaldehyde causes pneumonitis, pulmonary edema and allergic asthma, therefore using suitable personal protective equipment for the people working in these industries is needed. NaY zeolite seems to be a suitable absorption of formaldehyde and further research for its use in protective devices is warranted.

Keyword: Exposure assessment, Formaldehyde, Zeolite.

1- Occupational safety References Labortory, Tehransar, Karim Clinic, Tehran, Iran.
2- Department of chemistry, Arak University, Arak, Iran.
3- Department of pharmacology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran.
*Corresponding Author; E-mail: mojganzendehdel@yahoo.com