

Chemical health risk assessment for calcium carbide (CaC₂) used as fruits ripening agent among farmers and fruits sellers

ABSTRACT

Calcium carbide (CaC₂) is used as a chemical fruits ripening agent. A specific amount of phosphine gas (PH₃) released from the CaC₂ reaction with moisture is known to be toxic to respiratory system. This study was carried out to evaluate the potential risk of the CaC₂ and PH₃ among mango farmers and fruit sellers. The sample size was 200 respondents recruited by universal sampling in Perak, Kedah and Perlis. The procedure to perform chemical health risk assessment (CHRA) was based on the Use and Standard of Exposure of Chemical Hazards to Health Regulations 2000. The permissible exposure limit for PH₃ is 0.3 ppm 8. The average TWA for carbide wrapping and ripening in the farm (C) and at the fruit stall (D) was 0.033 ppm while for sales activities at the fruit stall (E) was 0.017 ppm. Thus, the magnitude rating for C and D was ≥ 0.1 O.E.L but < 0.5 O.E.L and for E was < 0.1 O.E.L. It was found that for respondents who were directly involved with the ripening process, the risk is significant for both CaC₂ and PH₃ and the risk were also found significant for those who were not involved directly with these chemicals such as staffs who only involved in sales especially in fruit stall. This study will be beneficial to famers where it can be used for them to understand the effect of carbide to human health and to increase awareness on the health impact of the use of CaC₂ to workers.

Keyword: Calcium carbide; Phosphine; Risk assessment