Simple method to assess health risk of vehicle interior pollution

In recent years, a vehicle cabin has been recognized as an important indoor environment for people often go working, shopping, traveling, school and home with vehicles. Unfortunately, people can exposure to airborne VOCs pollution in vehicular cabins. Interior air environment and health problems of vehicles have attracted increasing attention, and benzene, toluene, ethylbenzene, xylenes and styrene are primary hazardous gases in vehicular cabins.

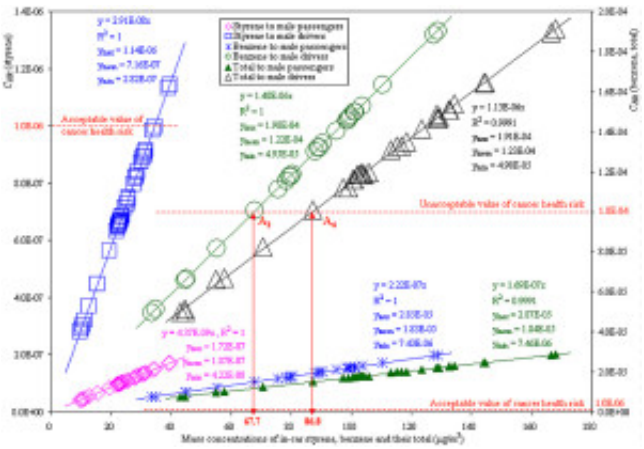

Fig. 1. Cancer health risk of vehicle interior VOCs pollution to male receptors.

According to the inhalation rate, exposure duration, exposure frequency, exposure time, average lifetime, average body weight of different receptors such as male drivers, female drivers, male passengers and female passengers, the vehicle interior VOCs concentrations, potency factor of cancer health risk, and reference concentration of inhalation for chronic non-cancer health risk, the health risk equations of vehicle interior VOCs pollution to different drivers and passengers are induced. For vehicle interior benzene pollution concentration (X, ?g/m^3) to male drivers, female drivers, male passengers and female passengers, the cancer health risk equations are Y = 1.48E-06X, Y = 1.42E-06X, Y = 2.22E-07X and Y = 2.13E-07X, respectively, and the non-cancer health risk equations are Y = 1.70E-03X, Y = 1.63E-03X, Y = 2.55E-04X and Y = 2.45E-04X, respectively. Another way to obtain the health risk equations is through the analysis of trend linearity, as shown in Figure 1.

Publication

Health risk equations and risk assessment of airborne benzene homologues exposure to drivers and passengers in taxi cabins.
Chen X, Feng L, Luo H, Cheng H.
Environ Sci Pollut Res. 2015 Nov 5