

Workplace assessment of naphtha exposure in a tire manufacturing industry.

ABSTRACT

A qualitative and quantitative workplace assessment was carried out to determine naphtha exposure in a tyre manufacturing industry. A qualitative chemical health risk assessment was conducted to identify naphtha hazard at the workplace. Quantitative assessment using Portable VOC Monitor, Automatic Sampling Pump and personal air sampling pump was used to determine VOC concentrations, organic solvents, and individual air naphtha respectively. The risk rating of naphtha was estimated to be 5. The mean VOC concentration was in the range of 2.43 to 92.93 ppm. Repair area had the highest VOC concentration while the lowest was in the moulding area. Each work station had significant differences for VOC concentrations ($p < 0.001$). Laboratory analysis found various solvents including 2-methyl pentane, hexane, methyl cyclopentane, heptane, cyclohexane and toluene which were present in the liquid naphtha. Only xylene has been detected in the making and moulding areas with a range of 2 to 5 ppm. Meanwhile, the air naphtha concentrations of the exposed workers were significantly higher than those unexposed. The risk of naphtha exposure was qualitatively significant and not adequately controlled. Naphtha was detected in all work stations since it is the main solvent used. The "Repair Area" was significantly more contaminated than the other area.

Keyword: Environmental monitoring; Risk assessment; Volatile organic compound (VOC); Naphtha; Personal air sampling.