

# Estimating the Amounts of Toluene Inhaled by Workers Wearing Protective Masks by Measuring Determinants Derived from Toluene in Biological Specimens

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## Abstract

Personal air samplers were attached to workers wearing protective masks during work to determine the levels of toluene vapors in the breathing zone.

Also, concentrations of toluene in exhaled air, blood and urine, and concentrations of hippuric acid and o-cresol in urine were determined.

Subsequently, concentrations of toluene vapors in the inhaled air of workers, with and without gas masks, were estimated using regression equations between concentrations of toluene in the air and biological exposure indicators of toluene. In the present study, wearing masks decreased exposure by 35 -45%. The exposure that remained was due to leakage of toluene through the interstice between the facepiece of masks and worker's faces and direct inhalation of toluene when removing masks. Workers must be taught proper procedures for using masks while an effort is made to lower toluene vapors in the workshop. Suitable methods are discussed, including the correction factor for estimating the amount of toluene inhaled using the biological exposure indicators of toluene.

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