

PATTERN OF INHALATION EXPOSURE: BLOOD LEVELS AND ACUTE SUBNARCOTIC EFFECTS OF TOLUENE AND ACETONE IN RATS

E. Frantík, L. Vodičková, M. Hornychová, M. Nosek

Centre of Industrial Hygiene and Occupational Diseases, National Institute of Public Health, Prague, Czech Republic

SUMMARY

Solvent blood concentrations and subnarcotic effects (inhibition of electrically evoked seizures) were measured in rats exposed to constant or fluctuating air concentrations of toluene or acetone. A 4 hour exposure of resting rats to toluene at an air concentration of 1 and 2 mg/l, or to acetone at 4 and 10 mg/l, led to blood levels of 6.7 and 12.8 mg/l of toluene, or 183 and 520 mg/l of acetone; seizure inhibition amounted to 18 % and 40 %, or 10 % and 50 %, respectively. Blood level and effect attained 1/2 of the final values after 40 min and 60 min of exposure to 2 mg/l toluene, respectively, and dropped to 1/2 70 min and 90 min after exposure cessation; respective values for acetone 10 mg/l were 80 and 120 min, and more than 4 hours. A steep rise and a rapid drop was characteristic also for the course of blood level and effect during an exposure to fluctuating concentrations of toluene; ten minute fivefold jump in the air concentration induced a shortlasting seizure inhibition by more than 80 %; the curves for acetone were flat.

Key words: solvents, toluene, acetone, inhalation exposure, exposure pattern, fluctuating air concentrations, blood level, subnarcotic effect

Address for correspondence: E. Frantík, National Institute of Public Health, Šrobárova 48, 100 42 Prague 10, Czech Republic