

ASSESSMENT OF AIRBORNE HEXAVALENT CHROMIUM IN THE HOME FOLLOWING USE OF CONTAMINATED TAPWATER

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Field studies were conducted to estimate the plausible uptake of hexavalent chromium [Cr(VI)] aerosols inhaled during indoor residential use of a shower or an evaporative cooler supplied with water containing Cr(VI). In the evaporative cooler study, water concentrations of 20 mg Cr(VI)/L did not produce an increased concentration of airborne Cr(VI). The indoor air concentration of Cr(VI), measured over 24 hours of use, was 0.3–2.7 ng/m³, about the same as the concurrent outdoor concentrations. In the shower study, the average airborne concentrations of Cr(VI) aerosols at breathing-zone height ranged from 87 to 324 ng Cr(VI)/m³ when the water concentration of Cr(VI) was 0.89 to 11.5 mg/L. The Cr(VI) concentration in air was correlated directly to water concentration. The lifetime average daily doses and incremental cancer risk estimates corresponding to 30-year residential exposures were calculated using the measurements in this study and published exposure guidelines. The plausible upperbound lifetime cancer risk associated with continuous exposure to “background” Cr(VI) in outdoor air was estimated at 6.9 per million for a person exposed during ages 0–30, and 4.0 per million for ages 30–60. Similarly