

EXPOSURE AND IMPACT ASSESSMENT OF EMISSIONS FROM MERCURY RECYCLING USING DOMESTIC RABBITS

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SUMMARY

A biomonitoring study using domestic rabbits (*Chinchilla*) aimed at the exposure and impact risks assessment of emissions released into the ambient air from a mercury-recycling plant has been carried out. Groups of rabbits were exposed to the emissions during 6 months at biomonitoring stations built up in two localities (Rudňany and Matejovce) in the distance of about 3 and 6 km around and downwind from the mercury-producing plant. The aim of the biomonitoring was to trace the translocation of inhaled inorganic Hg in body tissues and the immunotoxic impact of the emissions in the exposed mammalian organism in comparison to a non-exposed animals living outside the polluted area. The content of mercury (as a major pollutant in the ambient air in that area) in body tissues was done spectrometrically using a Trace Mercury Analyser TMA-254. Content of mercury and the other metals in the rabbits' hairs was determined by neutron activation analysis. A statistically significant increase of the inorganic Hg content in the specimens of kidneys, lungs, liver, thigh bone, heart muscle and brain was observed. Concerning the hairs, a statistically significant elevation of Hg and other elements (As, Cd, La, Zn, Na, K, W, Sr) has been found. The body tissue reaction to the increased accumulation of mercury has been investigated by a direct immunofluorescent method to search for body tissue immune complexes. The significant increase of Hg content determined in the organs (especially in kidneys and liver) of the exposed animals was also traced by the presence of immunofluorescent antibodies. In addition, the immunofluorescent antibodies in the myocardium have been proved. The findings may contribute to a larger scale exposure and impact risk assessments of ambient air metal aerosols especially in case of studies performed in heavily polluted areas.

Key words: mercury, exposure assessment, rabbit

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