

TRENDS OF LEAD, MANGANESE AND CADMIUM CONCENTRATIONS IN ZAGREB AIR

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This paper presents trends of annual mean values for lead, manganese and cadmium concentrations in TSPM, in PM10 and PM2.5 particles and their comparison with Croatian limit values, EU limit values and WHO Guidelines for Europe. The obtained data showed a decreasing trend of lead in TSPM, especially during the last ten years when consumption of lead-free gasoline increased. In 1997 the annual mean lead concentrations in TSPM were $0.5 \mu\text{g}/\text{m}^3$ which is in accordance to the EU limit value and WHO guideline for Europe. Since 1999 the concentrations fell down and they were below $0.25 \mu\text{g}/\text{m}^3$. The annual mean values of manganese in TSPM were very low during the whole period of measuring and they were below $0.15 \mu\text{g}/\text{m}^3$ which is in accordance to the WHO guideline for Europe. The trend of cadmium in TSPM slowly decreased and the concentrations were below $0.005 \mu\text{g}/\text{m}^3$ (WHO guideline for Europe) during the whole period of measuring except in 1989 in the city centre. The heavy metal concentrations measuring in PM10 and PM2.5 particles show very high percentages: 88-92% in the case of lead, 60-72% in the case of manganese and 82-97% in the case of cadmium, all were in PM2.5 particles.