# The fate of heavy metals in industrial recycling facilities of e-waste

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Occupational hygiene (respirable and inhalable airborne dust, settled dust and wipe samples) and human biomonitoring samples (urine and blood) were collected. Exposed workers were recruited who worked in industrial recycling of e-waste. Four target activities within e-waste processing were identified to have associations with exposure to chromium, cadmium, mercury and lead, (i) sorting of e-waste (ii) dismantling of e-waste, (iii) shredding and pre-processing e-waste, and (iv) metal processing for example melting for re-use. Workers were grouped into the following exposure groups: batteries, metals and plastics, white goods (such as refrigerators and washing machines), brown goods (such as TV, audio equipment and similar household appliances) and miscellaneous e-waste. Samples were also collected from workers who were not occupationally exposed to chromium, cadmium, mercury and lead through e-waste processes to form a comparison control group. Urine samples were collected from exposed workers at the beginning (pre-shift) and end (post-shift) of the workweek. Hair samples were collected in the morning preferably before the start of the workweek. Venous blood samples were collected towards the end of the workweek. Chromium, cadmium, mercury and lead has been analysed in urine samples and hair samples. Venous blood samples were collected for the analysis of cadmium and lead in whole blood and chromium in red blood cells. Air and wipe samples are used to identify exposure routes and risk reducing measures. Wipe samples were collected at the beginning and end of the air measurements (ca. 8h) to investigate the increase in dermal contamination. Settled dust samples workplace. Both inhalable and respirable personal dust measurements, hand wipes and settled dust samples were collected for the analysis of chromium, cadmium, mercury and lead.