



MASTER THESIS PROJECT

HUMAN BIOMONITORING OF THE EXPOSURE TO VOLATILE ORGANIC COMPOUNDS IN WORKERS OF AN OIL REGENERATION PLANT

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PLENTZIA (UPV/EHU), JULY 2023

4 ABSTRACT

Oil Regeneration is an industry in which workers can be in close contact with pollutants emitted from waste lubricant oils (WLO) such as Polycyclic Aromatic Hydrocarbons and Volatile Organic Compounds (VOCs). Biomonitoring pollutants exposure in these workers is relevant due to the known carcinogenicity of several of these compounds.

The aim of this work was to evaluate the exposure to VOCs in workers of the oil regeneration plant IT by comparing the levels of mercapturic acids (MAs) -biomarkers of exposure to VOCs- in different groups during maintenance activities before (BS) and after (AS) shift.

Sampling was held during a week of May 2020 in which the maintenance of the column used for distillation of WLO was carried out. Urine samples were taken from 18 workers from different companies (IT, B and M) in charge of different activities in the first and last day of the week, BS and AS each day. A total of 63 urine samples plus information about smoking habit were collected. MAs in urine were measured by LC-MS/MS with a previous optimization of the available method in the laboratory and its validation.

It was possible to validate the optimization of the method for 9 MAs: GAMA, AAMA, HEMA, DHBMA, AMCC, 3-HPMA, 2-HPMA, SPMA and SBMA. The comparison of the levels of the MAs BS and AS showed no statistically significant differences in any of the groups of workers assessed (total, workers from companies B, IT and M, workers who get into the column, workers who do not, smokers and non-smokers). The median levels obtained for each MA in the different groups were always below the assessment values available in bibliography. Although there were some specific cases of workers with levels above these values, most of them were smokers.

In conclusion, the activities held during the week of maintenance of the column for distillation of WLO did not represent an additional risk of exposure to any of the parent VOCs of the nine MAs for which the method was successfully optimized.