



A decreasing trend (1999-2007) of ambient levels of metals as a consequence of the implementation of PM abatement technology in a highly industrialised area of Spain

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Data on the spatial and time (1999 and 2002-2007) variation of levels of trace elements in PM_{10} and the source attribution of these elements in 4 monitoring sites of the ceramic cluster of Castelló (Eastern Spain) are presented and discussed. Studies carried out in 1999 concluded that metal levels in PM_{10} were one of the most critical parameters for attaining the EC Air Quality Standards requirements. Levels of Li, Sc, Co, Zn, As, Se, Rb, Zr, Cd, Cs, Ce, Tl and Pb were higher than the usual range of concentration in urban areas of Spain, and some of them exceeded the concentration ranges obtained for other industrial sites in Spain. From this group of elements, Zr, Zn, Pb, Tl and As may be considered as tracers of the ceramic emissions from the study area. A drastic downward trend was observed for most of these elements in since 2004, simultaneously with the progressive implementation of the emission abatement techniques, especially those applied to the manufacture of glaze components and the avoidance of the use of specific raw materials with high contents of impurities. At the end of the study period, the elements for which the EC sets limit or target values met the established requirements for 2013 (2005 for Pb), whereas at the beginning of the study some elements exceeded the 2013 target values. The detailed geochemical study of PM_{10} and $PM_{2.5}$ performed allowed identifying the emission sources and

quantifying their contributions, not only to ambient PM levels, but also to the levels of each trace element. This allowed the follow up of the degree of implementation of PM abatement technologies of the different industrial sectors and other anthropogenic emission sources.

Finally, the comparison of the levels of the element studied (around 50) with those usually recorded in urban sites of Spain (35 sites) allowed identifying target values to be reached for a number of elements without specific environmental standards in EC Air Quality standards and to include them in the emission measurement controls.

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