

Correlation between XRD Phase Analysis of EAF Slag and Heavy Elements Releasing in Water

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In the last few years, the importance of environmental impact issues has increased and to assess proper uses of by-product materials, as fly ashes and slags, has a primary role. Electric arc furnace (EAF) slags are already used in road construction, in concrete aggregates, and other applications. However, they may contain elements, as Mo, V, Ba, and Cr, that can contaminate soils and waters. Thus, an accurate analysis of the materials and their potential effects on the environment must be assessed.

SLAG NEW LIFE is an industrial collaborative project financed by Regione Lombardia and INSTM. The main project aim is the evaluation of the environmental impacts of these materials and their potential uses, through the correlation of chemical and structural analysis with the leaching tests.

In this work, two EAF samples, with and without adding the silica during the deslagging stage, were analysed and leaching tests have been performed according to EN 12457-2 and EN 12457-4 standards. To investigate the effect of particle sizes on leaching test results, the samples have been sieved in nine granulometric fractions. Leaching tests of the nine subsamples of each sample were performed and analysed by total reflection X-ray fluorescence. Relevant correlations have been identified, that allow to foreseen the belonging to the elements to different phases. These results have been correlated with the phase identification performed by X-ray diffraction and microdiffraction analysis. The correlation between the TXRF analysis of the eluates and the XRD analysis will be discussed.