

Ecotoxicity Evaluation Methodology for Metallurgical and Steel Wastes

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Abstract : The assessment of environmental hazard and ecotoxicological potential of industrial wastes has become an issue of concern in many countries. Therefore, the aim of this work is to develop a methodology, adapting an Argentinian standard, which allows analyze the ecotoxicological effect of various metallurgical and steel wastes. Foundry sand, white mud, red mud, electric arc furnace dust, converter slag, among others, are the studied wastes. The species used to analyze the ecotoxicological effects of wastes is rye grass (*Lolium Perenne*). The choice of this kind lies, among other things, in its easy and rapid germination making it possible to develop the test in a few days. Moreover, since the processes involved are general for most seeds, the obtained results with this kind are representative, in general, of the effects on seeds or seedlings. Since the studied residues are solids, prior to performing the assay, an eluate is obtained by stirring for 2 hours and subsequent filtration of a solution of waste in water in a relationship of 1:4. This represents 100% of eluate from which two dilutions in water (25% and 50%) are prepared. A sample with untreated solid waste and water is also performed. The test is performed by placing two filter papers in a Petri dish that are saturated with 3.5ml of the prepared dilutions. After that 20 rye grass seeds are placed, and the Petri dishes are covered and the seeds are incubated for 120 hours at 24 °C. Reference controls are carried out by distilled water. Three replicates are performed for each concentration. Once the exposure period is finished, inhibiting elongation of the root is measured (IR). The results of this test show that all the studied wastes produce an unfavorable effect on the development of the seedlings, being the electric arc furnace dust which more affects the germination.

Keywords : ecotoxicity, industrial wastes, environmental hazard, seeds

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