

Abstract

Understanding the Leaching Behaviour of Slags: Testing and Interpretation

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To enable the use of alternative aggregate materials, including slag, in road construction, it is necessary to be able to show that:

1. the material possesses suitable mechanical properties for the particular utilisation application;
2. the material will not cause an unacceptable degradation of the quality of the hydrological environment surrounding the construction.

This paper addresses the second of these requirements.

Leaching may be defined as the extraction of a soluble material from an insoluble solid by dissolution in a suitable solvent and the process of leaching encompasses the physical, chemical and biological reactions that mobilise a chemical species as well as the transport mechanisms that carry it away from the matrix into the surrounding environment. The controlling mechanisms of the leaching process are discussed in terms of solubility, availability and release rate dependence.

Leaching is generally assessed by using some form of leaching test. Numerous different test procedures exist, which generally fall into two categories: batch and flow-through. A range of test methods are reviewed including the latest developments from the European standardisation committees for the characterisation of waste (CEN TC 292) and aggregates (CEN TC 154). The different approaches taken by the two committees are highlighted.

The interpretation of leaching test data for the road construction scenario is reviewed with reference to recent publications from around Europe.

Leaching test data on slags is presented from a range of research projects. The most significant physical, chemical and biological reactions affecting the leaching of slags are discussed. The data is interpreted using a number of the available methods described.

Biographical Details

Annette Hill

Annette Hill graduated from the University of Nottingham in 1996 with a first class degree in Environmental Engineering and Resource Management. In 1997 Annette returned to the University to take up the position of Research Assistant within the Department of Civil Engineering. Annette specialised in the utilisation of waste materials for engineering applications, with a focus on material leachability. She will shortly be submitting her PhD thesis on this subject. Annette has published journal and conference papers in this field and has presented at leading academic and industry seminars.

Annette joined Scott Wilson's Waste Management Team in May 2001. She is currently involved in a range of projects including waste minimisation research with the University of Cambridge, groundwater risk assessments, landfill rehabilitation including gas and leachate management, construction supervision of waste facilities, air quality monitoring and construction waste management.