

Immobilisation Method

The Dolocrete® process has been recognised as a world leading technology for the immobilisation of organic and inorganic contaminants. The mechanism of the technology is complex and is protected by patent. The mechanism utilises the formation of synthetic minerals which mimic naturally occurring structures. The Dolocrete® mineralisation process involves a catalytic action with proprietary additives, causing the three dimensional polymerisation of the mineral structure. This matrix readily accommodates for the incorporation of various species into the matrix.

The treatment involves the initial homogenisation of the waste with water, then adding the Dolocrete® reagents at a ratio appropriate to the chemistry and concentration of the waste being treated. After complete mixing, the resultant slurry is cast into a suitable vessel for curing.

The pH of the Dolocrete® system is governed by the dissolution of the mineral matrix and is ultimately limited by the solubility product. Various studies have shown that the pH of the system is limited to pH 9.5-10. This pH range corresponds to the point of zero charge (pzc), which in turn corresponds to the point of minimum solubility for most metal hydroxide precipitates. For example, the pzc for the lead/carbonate/sulfate systems is in the range of pH 8.5-10 depending on the exact nature of the solubility-limiting phase. This pH corresponds exactly to the pH of the Dolocrete® system, thus ensuring that lead is at the point of minimum solubility.

It should be noted that the mobility of contaminants are not generally controlled by a single retention mechanism in complex systems. Many potential mechanisms exist including precipitation, co-precipitation, absorption, adsorption, lattice substitution and the formation of solid solution. The immobilisation of contaminants in the Dolocrete® system should be seen as a continuum of all of these mechanisms with specific mechanisms dominating under specific conditions.