

Zeta potential of organic soil in presence of calcium chloride, cement and polyvinyl alcohol

ABSTRACT

In this study the influence of various dosage of cement, polyvinyl alcohol (PVA), and calcium chloride (CaCl_2) on the zeta potential of organic soil has been examined. Two different PVA species were used, fully hydrolyzed (PVA-F) as well as partially hydrolyzed (PVA-T). As results, adding the PVA and cement dosage into the suspended colloids led to an increase of zeta potential in their surfaces, contrary to measuring done in water. In absence of CaCl_2 , zeta potential of organic soil immersed in PVA or cement showed a range between +22 to +211 mV at pH ~ 1.7 to 11.3, while, in presence of CaCl_2 the variation of zeta potential was in a range of +25 to -110mV at pH ~2.2 to 10.3. Although, there was no IEP in presence of CaCl_2 additives, a peak in zeta potential was observed for organic soil immersed in various electrolytes. Moreover, iso-electric point (IEP), for soil samples suspended in water is at pH about 3.1 to 3.3. However, the IEP of organic soil when is suspended in cement and/or PVA solution significantly decrease to the values about pH~1.9 to 2.0.

Keyword: Cement; Isoelectric point; Organic soil; Polyvinyl alcohol; Zeta potential