

A study on the chemical monitoring methods for concrete

The aim of this study was to establish a method of monitoring concrete neutralization by using an appropriate fiber optic sensor. As a first step, we developed a novel fiber optic sensor to detect the decrease in pH of pore liquid within the concrete. The proposed sensor is prepared by incorporating poly (N-vinyl acetamide) gel which contains pH indicator in a slit of a plastic optical fiber. In order to confirm the practicality of the sensor, monitoring experiments were carried out by using a mortar piece in which the sensor was embedded. Each end of the optical fiber was connected to a tungsten halogen light source and the detector of a visible spectrometer, respectively. Visible spectra of the transmitted light through the optical fiber were monitored during immersion of the mortar piece in HCl solution. The result suggested that our sensor can be used to detect the pH decrease in concrete caused by CO₂

Key words: concrete, neutralization, monitoring, pH indicator, optical fiber sensor