

STUDY ON MECHANISM OF VOLUMETRIC CHANGES BY INTERNAL VAPOR DIFFUSION BASED ON KINETIC THEORY OF GASES

S.Yokoyama¹⁾, H.Oshita¹⁾...

1) Chuo University, Civil and Environmental Engineering, Tokyo, Japan.

Corresponding author: s-yokoyama1127@civil.chuo-u.ac.jp

Abstract

It is necessary to evaluate the mechanism of the water migration in the microstructure and the volumetric changes of cement-based materials from a viewpoint of a micromechanical approach. In this study, the diffusivity model was developed in which the force of adsorption by the surface of pore walls is assumed to be dependent on the pore size. Moreover, the model of the volumetric changes which is caused by the vapor diffusion from the inside of the materials to the outside and the vapor diffusion only in the materials inside. Finally, comparisons between the experimental and analytical results for the volumetric changes of the cement paste due to the drying was performed and then the applicability of the proposed model was confirmed.