Notis Seminar

Waktu: 2.30 – 4.00 pm, Khamis, 23 November 2006
Tempat: Bilek Mesyuarat Fakulti Kejuruteraan, UKM, Bangi

Theoretical evaluation of swelling and hydraulic properties of bentonite material for underground disposals of radioactive waste and industry waste in Japan

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<u>Abstract</u>

In Japan, bentonite is currently planned for use as a buffer and backfill material for repositories of radioactive waste because these materials must have high swelling characteristics and very low permeability to seal the waste. Bentonite is actually used as artificial barrier in industrial waste facility, too. The topics of this talk are the theoretical equations for predicting swelling and hydraulic properties of bentonite proposed by Komine.

To design specifications of buffer/backfill and artificial barrier, Komine has proposed a new prediction method for swelling characteristics of bentonite-based buffer material. This prediction method comprises some equations that were previously developed for repulsive and attractive forces between two montmorillonite layers. Others included in the method are Komine's equation previously proposed for (1) the swelling volumetric strain of montmorillonite, and (2) the influences of pore water chemistry and specific surface of bentonite. The applicability of the prediction method is clarified by comparing predicted results with experimental data for five kinds of bentonite produced in Japan and the United States.

Komine has also derived the theoretical new equations for evaluating the hydraulic conductivity of compacted bentonites and bentonite-sand mixtures for designing specifications of buffer/backfill and artificial barrier. New equations for evaluating the velocity of interlayer-water flow between two montmorillonite layers considering the swelling behaviors of montmorillonite are proposed. Furthermore, a calculating method for the hydraulic conductivity of compacted bentonite and bentonite-sand mixtures is presented by combining the new equations with the equations for evaluating swelling behavior of montmorillonite in bentonite, which have already been proposed by Komine. The applicability of this method is investigated by comparing the calculated results with laboratory test results on the hydraulic conductivity of compacted bentonites and bentonite-sand mixtures.

Jamuan ringan akan disediakan selepas seminar. Untuk maklumat lanjut, sila hubungi Prof Madya Dr. Ir. Abdul Khalim Abdul Rashid, di Jabatan Kejuruteraan Awam dan Struktur (JKAS), UKM Tel: 03-8921 6202 atau 03-8921 6212-Pejabat Am,. e-mail: **khalim@vlsi.eng.ukm.my**