

Pore space visualization in geomaterial

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We improved the methods of pore space visualization using X ray computerized tomography (CT) medical scanner, optical microscope observation of void space filled with colored resin, Confocal Scanning Laser Microscope (CSLM), mercury intrusion porosimetry and Atomic Force Microscope (AFM). We developed new method by the usage of AFM combined with the data of pore size distribution by mercury intrusion porosimetry. The image processing of the visualized pore image can produce the geometric data such as pore square and hydraulic radius. We also assessed the advantages and disadvantages of each method. Using these visualized pore images, permeability can be roughly estimated by equivalent channel modelling.

Advection and diffusion processes in geomaterials are currently being studied in various backgrounds such as groundwater, environmental science and geology. Such a mass-transfer property depends critically on two major factors; migration force and pore network.

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