

Use of NMR Imaging For Determining Fluid Saturation Distributions During Multiphase Displacement in Porous Media

Kyung-Hoe Kim, Songhua Chen, Fangfang Qin and A. Ted Watson

Department of Chemical Engineering
Texas A&M University
College Station, TX 77843-3122

ABSTRACT

The use of nuclear magnetic resonance imaging for determination of porosity and saturation distributions is demonstrated. Profile images are obtained during displacement experiments, whereby one fluid phase in a porous media is immiscibly displaced by another, as well as under static conditions. Procedures are developed to estimate the intrinsic intensity of magnetization from the measured profile images. The intrinsic intensity of magnetization is then scaled to determine saturation and porosity. The spatial and saturation dependence of transverse relaxation is considered in estimating the intrinsic magnetization, and procedures for selection of appropriate relaxation models are provided. Results obtained for several limestone samples are presented.