

Experimental study on the residual saturation of Porous Media using Pore Doublets Micromodel

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In this study, we use a micromodel of PDM with different channel diameter ratios to study the fluid entrapment and mobilization. This study focuses on the evolution of the trapping and the amount of residuals saturation in the porous media. We observed the movement of wetting and non-wet liquids during the imbibition and drainage processes. We found that, with the low injection flow rates, the residual amount was strongly related to the contact angle; with the high injection flow rates, viscous force was dominated the trapping process. The results also showed that the liquids were trapped in the small tube for low injection rate, and in the large tube for the high injection rate. Our findings can help to control the residual saturation during water-flooding oil recovery, groundwater remediation, and the storage of carbon dioxide in deep subsurface.