

Uniqueness and Repeatability Analysis for Slim Tube Determined Minimum Miscibility Pressure

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Abstract : Miscible gas injection processes as secondary recovery methods can be applied to a huge number of mature reservoirs to improve the trapped oil displacement. Successful miscible gas injection processes require an accurate estimation of the minimum miscibility pressure (MMP) to make injection process feasible, economical, and effective. There are several methods of MMP determination like slim tube approach, vanishing interfacial tension and rising bubble apparatus but slim tube is the deployed experimental technique in this study. Slim tube method is assumed to be non-standardized for MMP determination with respect to both operating procedure and design. Therefore, 25 slim tube runs were being conducted with three different coil lengths (12, 18 and 24 m) of constant diameter using three different injection rates (0.08, 0.1 and 0.15 cc/min) to evaluate uniqueness and repeatability of determined MMP. A trend of decrease in MMP with increase in coil length was found. No unique trend was found between MMP and injection rate. Lowest MMP and highest recovery were observed with highest coil length and lowest injection rate. It shows that slim tube measured MMP does not depend solely on interacting fluids characteristics but also affected by used coil selection and injection rate choice. Therefore, both slim tube design and procedure need to be standardized. It is recommended to use lowest possible injection rate and estimated coil length depending upon the distance between injections and producing wells for accurate and reliable MMP determination.

Keywords : coil length, injection rate, minimum miscibility pressure, multiple contacts miscibility

Conference Title : ICOGPE 2016 : International Conference on Oil, Gas and Petrochemical Engineering

Conference Location : Toronto, Canada

Conference Dates : June 13-14, 2016