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An Experimental Investigation of Steam Distillation of Trinidad Crude Oils

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Abstract: *In steam flooding operations, oil recovery by steam distillation can be in the range of 5.0 % to 60.0 %, and there is a need for separate experimental studies and data for accurate steam flood design and predictions. Steam distillation studies were conducted on six Trinidad oil samples with gravities ranging from 11.6° to 30.6° API (American Petroleum Institute) using a locally assembled steam distillation apparatus. The experiments were performed in an 'open' (without a porous medium) cell, 91.0 cm long and 3.81 cm in diameter. The six oil samples were distilled using saturated steam at pressures ranging from 0.101 to 4.654 MPa and steam temperatures from 100 to 260 °C. The results obtained were tabulated and displayed graphically for comparison. Steam distillation yield increased significantly with an increasing saturated steam conditions for the same sample. Furthermore, for the same saturated steam conditions, steam distillation yield increased with increasing API gravity. The increase was in the range of just above 2.0 % at a steam distillation factor of 0.1 to just below 60.0 % at a steam distillation factor of 10. The results further showed that beyond a steam distillation factor of 4.0, the increase in the distillation yield was under 7.0 %. Although steam distillation yield correlated well with steam distillation factor, it cannot be correlated with API gravity because of differences in crude type which can affect the distillation process. The data obtained from this study are not available in the open literature and has important applications when performing steam flood simulation studies for Trinidad oil reservoirs. It can also be used in the testing and development of steam distillation predictive models for local and worldwide applications with steam flood simulation models and for steam flood designs.*

Keywords: *Oil, steam, steam distillation, temperature, pressure, API gravity, Trinidad*