

Well Testing

John Lee

Professor of Petroleum Engineering
Texas A&M University

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using Fig. D-13 (for gas-free water) and Fig. D-14 (to correct for the effect of gas in solution). Ramey's correlation,⁶ presented in Fig. D-15, is used to estimate dR_{sw}/dp for fresh water, and Fig. D-11 is used to correct for the effect of salinity on dR_{sw}/dp .

This compressibility estimate requires knowledge of formation-water salinity, reservoir temperature and pressure, and formation volume factor of the gas dissolved in the water. Example D.11 illustrates this estimation procedure.

Example D.11 – Estimation of Water Compressibility in a Saturated Reservoir

Problem. Estimate the apparent compressibility of formation water containing 30,000 ppm dissolved solids in an undersaturated oil reservoir at 200°F and

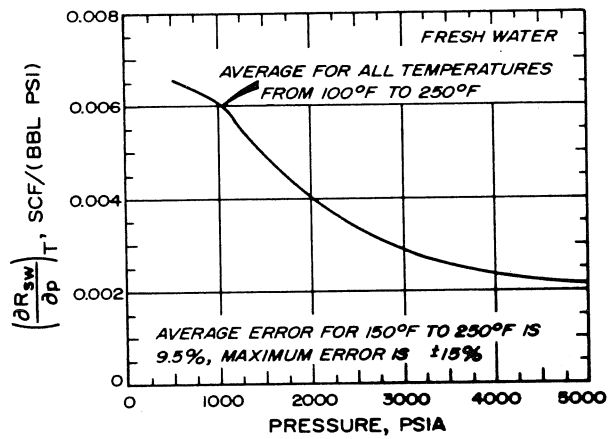


Fig. D-15 – Change of natural gas in solution in formation water with pressure vs. pressure.¹

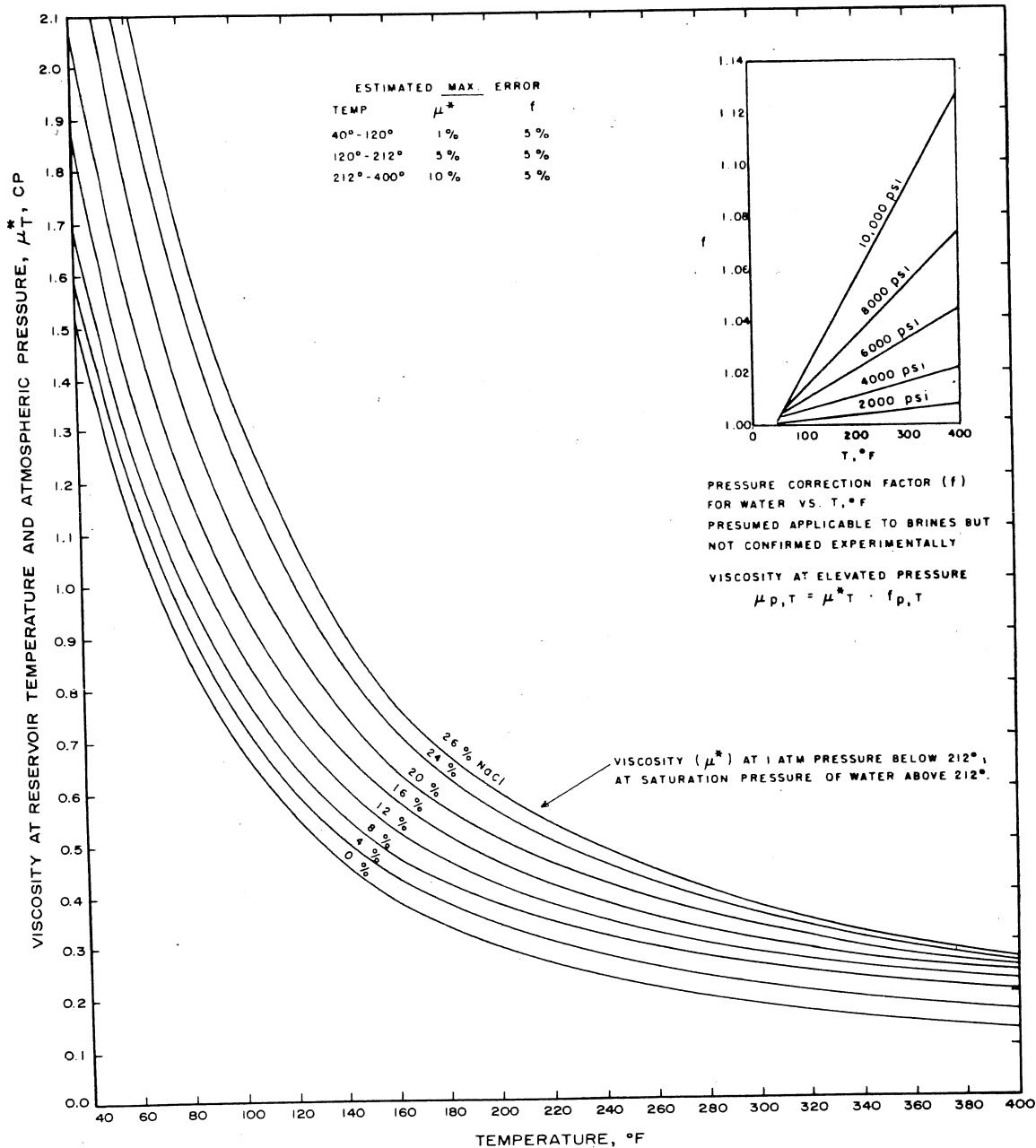


Fig. D-16 – Water viscosity at various salinities and temperatures.¹