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'Fizz' water and low gas saturated reservoirs

Numerous dry holes have been drilled based on false hydrocarbon indicators (DHI) and have been attributed to 'fizz water' effects. However, this 'fizz water' concept is ill-defined and misunderstood. Newly measured data show that dissolved gas has negligible effect on water velocity. In addition, gas bubbles exsolving from either water or oil have only a small effect on fluid properties at pressures higher than about 20 Mpa (about 3000 Psi). Gas at high in situ pressure and temperature conditions has similar properties to light oil. Realistic gas properties must be used to estimate the properties of gas-liquid mixtures. Trapped original gas distribution in situ may be patchy (in layers or packets), while the exsolved or leaked gas distribution is likely to be relatively homogenous. Although fluid properties and gas distributions are complicated in deep-water reservoirs, seismic evaluation of gas saturation is possible. Developing seismic techniques to quantitatively calibrate hydrocarbon indicators in addition seismic evaluation of rock density and attenuation should lead to new integrated techniques for better evaluation of hydrocarbon saturation.