

FLUID SATURATION INTRODUCTION

Fluid Saturations

- Definition - The fluid saturation for a particular fluid is the fraction of pore volume occupied by that fluid
 - Saturation is an intensive property
 - Equations: $S_o = V_o/V_p$, $S_w = V_w/V_p$, $S_g = V_g/V_p$
 - These fluid volumes are measured under specific conditions of pressure and temperature (e.g. reservoir, or laboratory)
 - reservoir conditions are often noted as “*in situ*”

Fluid Saturations

- Fundamental Relationships

- Pore volume is occupied by fluids (water, oil, and/or gas)

$$V_p = V_w + V_o + V_g$$
$$1 = \frac{V_w + V_o + V_g}{V_p} = S_w + S_o + S_g$$

- for the two phase case, only one of the two saturations is independent, the other must make the sum of the saturations equal to unity (1)
- similarly, for the three phase case, only two saturations are independent