

Measurable specifications of heavy oils for estimation of thermophysical properties related to design and operation of equipment in production and processing

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Resources for light and conventional oils are in decline in the world and more attention has been given to the use of heavy and unconventional oils. Reserves of heavy oils in the world are estimated at more than 5 trillion barrels in which 20% are in the Middle East. Production and processing of heavy oils require special units and equipment which operate under different conditions different from conventional oils. Heavy oils contain more asphaltene, wax, sulfur and metals which need to be separated before converting into useful products. Design and operation of such units require knowledge of thermal and physical properties which are not possible to measure under different operating conditions. However, these properties can be accurately estimated through some measurable specifications such as distillation data, PNA analysis or viscosity. Although such specifications can be measured conveniently for conventional oils but they are not easily measurable parameters for specifications of heavy oils due to difficulties such as thermal cracking, etc. In this presentation we look at certain properties such as density, speed of sound, dipole moment, etc. which can be measured to determine specifications of heavy crude oils and heavy and subsequent use in estimation of thermodynamic properties such as compositional analysis, phase diagram, gas solubility, etc.

Biography

M. R. Riazi completed his Ph.D. in Chemical Engineering from Penn State University where he was served as an Assistant Professor. He is currently a professor of Chemical Engineering at Kuwait University and the Director of Graduate Program. He has over 100 publications including three books related to petroleum technology. He has been consultant worldwide to the petroleum industry and has conducted over 100 lectures or workshops in various countries. He is founding editor and editor-in-chief of Int. J. of Oil, Gas and Coal Technology (London) as well as an Editor of J. of Pet. Sci. and Eng. (Netherlands).

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