KLINKENBERG PERMEABILITY MEASUREMENTS: PROBLEMS AND PRACTICAL SOLUTIONS

Colin A. McPhee and Kevin G. Arthur
Edinburgh Petroleum Services Limited, UK.

Abstract Conventionally-derived Klinkenberg parameters, obtained on core plugs over a wide range of permeabilities, are shown to be sensitive to the methods, procedures and techniques used to acquire and analyze the data. Practical recommendations are presented which, simply applied, can overcome or minimize many of these experimental problems, and yield more reliable and realistic data. The importance of selecting test flow procedures, optimizing process sensor accuracy, standardizing sleeve and net effective core pressures, and recognizing and correcting data for the effects of non-Darcy flow, are demonstrated. Although concentrating on the practical problems, this study does reveal some limited evidence which questions a fundamental tenet of gas slippage theory related to porous media and its applicability in Klinkenberg permeability determination.