

Methods and apparatus are provided for determining the pore volume compressibility, the porosity at stress and the relative porosity change of reservoir rock samples. In accordance with the invention, as few as two pore volume measurements of reservoir rock samples are obtained at simulated overburden pressures and relatively low pore pressure. From these data, a bi-logarithmic plot of pore volume versus pressure for a given reservoir rock sample is prepared. From the slope of the plot, pore volume compressibility of the reservoir rock sample at a given overburden pressure is directly calculated. In a further aspect, the intercept of the pore volume versus pressure plot is obtained, and, in conjunction with a measurement of the grain volume of the sample, the porosity at stress and relative porosity change of the rock sample are determined.