On the Determination of Pore size distribution from Injection of yield stress fluids through model porous media

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ABSTRACT: Current methods used to determine pore size distribution of porous media (as mercury porosimetry) present several drawbacks the main of which is their toxicity An innovative method using yield stress fluids has been proposed in the literature. The main idea in these works is that using fluids with a threshold below which the fluid does not flow allows obtaining the pore size distribution by simply measuring the evolution of the flow rate versus pressure gradient. In fact this attractive method should be carefully handled and very precise experimental results are needed to make the method tractable in order to meet the targeted objective. This will be discussed through presentation of our recent experimental results. In these experiments two kinds of fluids where specifically formulated and rheologically characterized. These fluids were injected in both simple and complex artificial porous media and flow rate-pressure gradient relationships where established allowing us to estimate the pore size distribution.