

0014

Application of the Liquid-Liquid Porometry for Characterization of Pore Structure of Filtration Media

Status: Accepted

Category: 2 Filter Testing

Akshaya Jena, [Krishna Gupta](#)
Porous Materials, Inc., Ithaca, NY, United States

Capillary flow porometry is being widely used for pore structure evaluation of filtration media for liquid filtration because this technique is capable of measuring through pore throat diameter, bubble point pore diameter, mean flow pore diameter, and pore distribution, which are the pore structure characteristics most appropriate for liquid filtration. In this technique, gas flow rate is measured with increasing differential pressure through a dry sample and the sample wetted with a wetting liquid. The pressure needed can be much higher than 500 psi for very small pore samples. High pressure often damages some samples. Also small pore samples may have too low immeasurable flow rate.

A novel way of performing liquid-liquid porometry has been developed for overcoming many of these difficulties. In capillary flow porometry an inert gas is used to displace wetting liquid from pores and gas flow rate is normally measured using flow meters. In liquid-liquid porometry, the wetting liquid is displaced from pores by another wetting liquid having higher surface tension. The very low liquid flow rates are measured using a microbalance. Liquid-liquid porometry, in addition to measuring pore throat diameters like capillary flow porometry, measures liquid flow rate.

The pore structures of a number of water filtration media characterized by the liquid-liquid technique are presented. The same media were also characterized by capillary flow porometry. Results obtained by both techniques are comparable. The strengths and limitations of the two techniques are discussed.

Bio

Dr. Krishna Gupta, Sc. D. (MIT) is the president and founder of Porous Materials, Inc., which specializes in innovative pore structure characterization techniques. He published over eighty articles, holds fifteen patents and received 3 international awards for the design and development of novel instruments. Porous Materials, Inc. or PMI is globally recognized for the design and the manufacturing of high-quality, inventive instruments, such as the Advanced Capillary Flow Porometers, the Liquid-Liquid Porometers or the Vacuapores.