

Title: Effect of Filter Membrane Morphology on Separation Efficiency

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Abstract:

Membrane filters are widely used in micro filtration applications. The type of membrane used can vary widely depending on the particular application, but broadly speaking the requirements are to achieve fine control of separation, with low power consumption. The answer to this problem might seem obvious: select the membrane with the largest pore size and void fraction consistent with the separation requirements. However, membrane fouling (an inevitable consequence of successful filtration) is a complicated process, which depends on many parameters other than membrane pore size and void fraction; and which itself greatly affects the filtration process and membrane functionality. The challenge posed here is to devise mathematical models that can (i) account for the membrane internal morphology (internal structure, pore size & shape, etc.); and (ii) describe the fouling and separation.