

Abstract Submitted
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Foam imbibition in a Hele-Shaw cell via laminated microfluidic “T-junction” device DINA PARRA, THOMAS WARD, Iowa State University — In this talk we analyze experimental results of a novel microfluidic “T-junction” device, made from laminated plastic, that is used to produce foam in porous media. The fluids, both Newtonian and non-Newtonian liquids and air, are driven using constant-static pressure fluid pumping. For the T-junction geometry studied there are novel observations with this type of pumping: 1) at low pressure ratios there is an increase in the liquid and total flow rates and 2) at higher pressure ratios there is a decrease in the liquid flow rate. To understand this phenomenon we visualize the drop production process near the T-junction. Furthermore, flow rates for the liquid and total volume are estimated by imbibing the foam into a Hele-Shaw cell. Foam is produced by using a mixture containing aqueous polyacrylamide of concentrations ranging from 0.01-0.10% by weight and several solution also containing a sodium-lauryl-sulfate (SLS) surfactant at concentrations ranging 0.01-0.1% by weight.

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