



## **Experimental investigation of the displacement of viscous fluids from porous media**

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The problems of increase of oil recover by means of a reservoir flooding are considered as a basis for the study. The results of laboratory experimental investigations of different-viscosity and immiscible Newtonian fluid flows through porous media are presented. The investigations were carried out for a Hele-Shaw cell filled by two types of porous media. The basic difference from the previous studies is the observation of the flow after break-through of the displacing fluid into sink. A series of qualitative and quantitative results which clarify the physics of immiscible fluid flows through capillaries and porous media were obtained in the course of the experimental investigations. Experiments carried out confirm the proposition of the Saffman-Taylor theory concerning the instability of the displacement front when a lower-viscosity fluid displaces a higher-viscosity fluid. It was found that the unstable flow pattern is determined not by the length of the capillary wave which disrupts the flow but by the geometry of the pore space. Experiments on the displacement of oil from capillary by water show that the oil can be completely driven out of the capillary due to the development of wavy flow after the displacing fluid arrives at the capillary outlet.