عنوان مقاله:

The Effect of Spent Acid on Carbonate Rock Wettability During a Matrix Acidizing Treatment

محل انتشار:

هجدهمین کنفرانس ملی پژوهش های نوین در علوم و مهندسی شیمی (سال: 1401)

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خلاصه مقاله:

In carbonate formations, matrix acidizing works by forming conductive channels, called “wormholes,” through the formation rock. Wormholes penetrate beyond the near-wellbore region or extended from perforation. These processes create a stimulation region around the well with large wormholes that are high conductive and thus eliminate any effects of damaged permeability around the well. However, beyond the wormholes, there will be an extensive region of rock containing spent acid and acid reaction products, which are primarily calcium chloride and water. Spent acid solution beyond the stimulated region may interact physically and/or chemically with the reservoir fluids as well as with the minerals. The authors present an experimental study of the effect of spent acid on wettability alteration of carbonated rock. Spent acid was prepared from HCl ۱۵%. Linear core flooding was conducted to inject spent acid through carbonate rock cores. The sessile drop technique was used to determine the original and altered wettability of the carbonate rock. The result before spent acid injection indicates that the contact angle of n-heptane droplet on polished rock surface surrounded by distilled water attained an average angle of ۳۷۰. This angle lies in the range of water-wet rock. After acid treatment average of attained contact angle was ۵۶۰, which indicates that the spent acid tends the carbonate rock toward the oil wet.

کلمات کلیدی:

carbonate rock, contact angle, sessile drop technique, spent acid, wettability