

Development and Application of Rapid Filtration and Consolidation Lost Circulation Material ZYSD

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ABSTRACT

Channels in fractured leakage are complex and sensitive to induction. If conventional bridge plug lost circulation material is used, its particle size is hard to match with the fracture size, so the success rate of plugging is low and repeated leakage is likely to occur. If cement slurry is used, besides poor retention performance, it may also cause safety risk. Therefore, based on the principle of "rapid filtration and retention+fiber mesh plugging+gel solidification", filtration material, fiber mesh material and gel solidification material were prepared to fabricate the rapid filtration and consolidation lost circulation material ZYSD that is suitable for fractured leakage. Lab performance evaluation tests showed that the suspending stability of ZYSD plugging slurry was good, and the syneresis rate in 1min was less than 5%. Moreover, the filtration rate was fast with the total filtration time of 10-15 s under the pressure of 0.69 MPa and the plugging capacity was good with the bearing pressure of the formed plugged zone in 5-10 mm fractures up to 18.5 MPa. The lost circulation material ZYSD was used in 32 wells in North Ordos, Yanchang, Jidong, Zhongyuan, Fuling and other oil/gas fields. The one-time plugging success rate was up to 87.5% and no repeated leakage occurred. The successful applications indicated that the lost circulation material ZYSD could effectively solve the problems of low plugging success rate, brief effective plugging period and repeated leakage in fractured leakage.