
抗高温水基钻井液技术

摘要

长深 5 井位于地热增温率十分明显的松辽盆地，根据此地区已经完钻井的数据分析，可以推测出长深 5 井全井钻进阶段的温度将超过 200°C，仅仅采用普通的钻井液是无法顺利完成在此高温下的钻井要求，所以此井需要采用抗高温水基钻井液。

第一步，优选出具有抗温能力的钻井液，对其进行实验室性能评价，实验数据证明，此钻井液的高温稳定性效果显著，悬浮和携带岩屑的效果良好，能抵制泥页岩产生水敏反应，具有封堵防漏作用，能够对油层起到良好的保护作用，满足完钻井底的需求；第二步，对于已经选出的高温钻井液进行转变模拟试验，可以证实，将新合成的抗高温水基钻井液逐渐加入原浆中，可以形成新的抗高温水基钻井液。第三步，通过现场配制钻井液，施工后数据分析得出结论，此方法可以满足长深 5 井的勘探开发需要。抗高温水基钻井液的成功，对于以后松辽盆地深井的勘探开发积累了成功的经验。

关键词：长深 5 井；高温；深井；水基钻井液

Abstract

Based on the data analysis of the completed drilling in this area, it can be inferred that the temperature of the full well drilling phase of the ChangShen 5 well will exceed 200°C. It is impossible to successfully complete the drilling requirements at this high temperature with ordinary drilling fluid alone.

The first step is to select the drilling fluid with temperature resistance and evaluate its laboratory performance. The experimental data prove that the drilling fluid has significant high-temperature stability, good suspension and carrying of rock chips, can resist the water-sensitive reaction of mud shale, has the function of plugging and leakage prevention, can play a good protective role on the formation and meet the needs of the completed drilling bottom; the second step is to conduct a transformation simulation test on the selected high-temperature drilling fluid, which can confirm that the newly synthesized high-temperature resistant water-based drilling fluid can be gradually added to the raw slurry to form a new high-temperature resistant water-based drilling fluid. In the third step, drilling fluids were formulated on site and post-construction data analysis concluded that this method could meet the exploration and development needs of the long and deep 5 wells. The success of the anti-high temperature water-based drilling fluid has accumulated successful experience for the future exploration and development of deep wells in the Songliao Basin.

Key words: Long and deep 5 wells; high temperature; deep wells; water-based drilling fluids

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