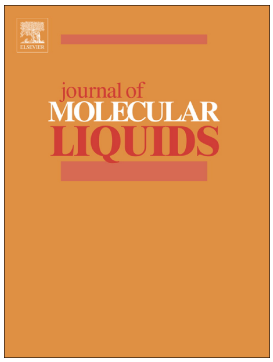

Experimental study on high temperature resistance aluminum-crosslinked non-aqueous fracturing fluids

Jincheng Mao, Dingli Wang, Xiaojiang Yang, Zhaoyang Zhang, Bo Yang, Chong Zhang, Jinzhou Zhao

PII: S0167-7322(17)35850-6
DOI: doi:10.1016/j.molliq.2018.03.032
Reference: MOLLIQ 8806

To appear in: *Journal of Molecular Liquids*

Received date: 7 December 2017
Revised date: 10 February 2018
Accepted date: 8 March 2018

Please cite this article as: Jincheng Mao, Dingli Wang, Xiaojiang Yang, Zhaoyang Zhang, Bo Yang, Chong Zhang, Jinzhou Zhao , Experimental study on high temperature resistance aluminum-crosslinked non-aqueous fracturing fluids. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Molliq(2017), doi:10.1016/j.molliq.2018.03.032

Experimental Study on High Temperature Resistance Aluminum-Crosslinked Non-Aqueous Fracturing Fluids

Jincheng Mao, Dingli Wang, Xiaojiang Yang*, Zhaoyang Zhang, Bo Yang, Chong Zhang and Jinzhou Zhao**

State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation, Southwest Petroleum University, Chengdu 610500, P. R. China

Abstract

As we know that hydraulic fracturing as a major method has gained great attention in developing the unconventional oil and gas resources in the past decades. Since the unconventional reservoir is very complex and the success of fracturing operation depends largely on the performances of the fracturing fluid, a good fracturing fluid such as a low carbon hydrocarbon non-aqueous fracturing fluid can be a good solution to these problems. A non-aqueous fracturing fluid with good performance was obtained in the presence of main agent aluminum sulfate, aluminum chloride or aluminum nitrate. The reaction time, temperature, material ratio and crosslinking ratio were carefully screened to match the new dialkyl phosphate in a base fluid of n-pentane or n-hexane *via* cross-linking to prepare a novel type of low carbon hydrocarbon non-aqueous fracturing fluid for unconventional reservoir. This fracturing fluid system performed excellent heat and shearing resistance, and could maintain high viscosity at high temperature (120-167 ^{o}C), which could be further proved by the clear structure of microscopic three-dimensional network. Finally, the fracturing fluid could be broken quickly without any residue. It can be seen that such features make it potentially economic, useful and practical as an alternative technology, especially under the condition of water shortage.