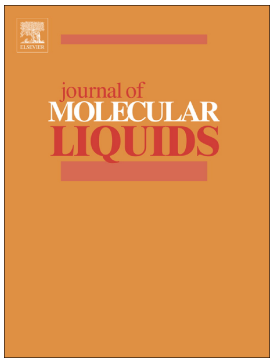

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Nonionic Polyol Esters as Thinner and Lubricity Enhancer for Synthetic-Based Drilling Fluids

Dina Kania[a], Robiah Yunus[a,*], Rozita Omar[a], Suraya Abdul Rashid[a,b], Badrul Mohamed Jan[c], Niloofar Arsanjani[d]

[a] *Department of Chemical and Environmental Engineering, Faculty of Engineering, University Putra Malaysia, 43400 Serdang, Malaysia*

[b] *Institute of Advanced Technology, University Putra Malaysia, 43400 Serdang, Malaysia*

[c] *Department of Chemical Engineering, Faculty of Engineering, University of Malaya, 50603 Kuala Lumpur, Malaysia*

[d] *Global Research and Technology Centre of Scomi Oiltools Sdn. Bhd., 40105 Selangor, Malaysia*

*Corresponding author. Email: robiah@upm.edu.my (Robiah Yunus), mailing address: Department of Chemical and Environmental Engineering, Faculty of Engineering, University Putra Malaysia, 43400 Serdang, Malaysia.

Abstract

This study evaluates the performance of polyol esters as thinners and lubricity enhancers in invert emulsion synthetic-based drilling mud (SBM). Three types of polyol esters, namely pentaerythritol ester (PEE), trimethylolpropane ester (TMPE), and neopentyl glycol ester (NPGE), were prepared at various concentrations of 1, 2, and 3% (v/v) in SBM. The results showed that polyol esters reduced the rheological properties of the drilling mud, such as yield point and gel strength, after the hot rolling test at 135°C. The rheology data was fitted to the Herschel-Bulkley model to describe the shear thinning behaviour of drilling mud. The model parameters showed that the polyol ester resulted in lower yield stress of SBM, which indicated