

委内瑞拉常压渣油供氢热转化研究

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Hydrogen donor visbreaking of Venezuelan atmospheric residue

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- 摘要
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摘要 采用高压釜研究了委内瑞拉常压渣油的常规减黏裂化与供氢热转化过程。结果表明,相比常规减黏裂化而言,供氢热转化过程中的供氢剂能够抑制气体产物、沥青质以及焦的形成,后者的气体收率比前者低0.5%~1.2%,生焦率低0.02%~0.98%,残渣油沥青质含量低0.6%~1.3%;在反应温度425℃、反应时间5~20 min条件下,供氢热转化过程的总降黏率、净降黏率变化分别为46.1%~54.8%、10.2%~33.0%;供氢热转化过程的较佳反应条件为425℃、5 min,此条件下供氢热转化生成油斑点实验等级为一级(ASTM D4740),运动黏度(50℃)为185.5 mm²/s,净降黏率为26.4%,满足了船运的基本要求。

关键词: 常压渣油 超重油 供氢剂 热转化 安定性 降黏率

Abstract: Visbreaking and hydrogen donor visbreaking of Venezuelan atmospheric residue were evaluated in an autoclave. The results show that hydrogen donor employ in visbreaking process is able to inhibit gas production, coke formation and asphaltene formation of residua in the thermal conversion process. To be specific, gas and coke yield in hydrogen donor visbreaking are less than that in visbreaking by 0.5%~1.2% and 0.02%~0.98% respectively, and asphaltene content of its residual oils is less than that of visbreaking by 0.6%~1.3%. With the reaction time increasing from 5 to 20 min at 425℃, the total and net viscosity reduction rate of hydrogen donor visbreaking process varies in 46.1%~54.8% and 10.2%~33.0%, respectively. The optimum reaction condition for hydrogen donor visbreaking process is obtained at 425℃ for 5 min. Under this condition, the properties of hydrogen donor visbroken oil are as follows: the spot test rates NO. 1 according to reference spot description in ASTM D4740, the kinematic viscosity measured at 50℃ is 185.5 mm²/s and the net viscosity reduction rate is 26.4%, which meet the basic requirements of transportation.

Key words: atmospheric residue ultra-heavy oil hydrogen donor thermal conversion stability viscosity reduction rate

收稿日期: 2012-02-22;

基金资助:

中国石油天然气股份有限公司委内瑞拉超重油减黏基础研究(供氢热裂化)项目(W2008E-1502/2); 中央高校基本科研业务费专项资金资助(12CX06041A)。

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引用本文:

王齐, 王宗贤, 沐宝泉等. 委内瑞拉常压渣油供氢热转化研究[J]. 燃料化学学报, 2012, 40(10): 1200-1205.













WANG Qi, WANG Zong-xian, MU Bao-quan et al. Hydrogen donor visbreaking of Venezuelan atmospheric residue[J]. J Fuel Chem Technol, 2012, 40(10) 1200-1205.

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