

能源和环境工程

## 卵磷脂对甲烷水合物形成的影响

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收稿日期 2006-12-5 修回日期 2007-6-12 网络版发布日期 2007-11-7 接受日期

摘要

建立了用于测定卵磷脂(lecithin)对钻井液中水合物形成影响的实验装置及方法,以理解化学添加剂卵磷脂对北极 Cascade 地区钻井过程中水合物层的稳定作用。本研究旨在理解卵磷脂对纯水中甲烷水合物形成热力学和动力学的影响。结果表明,卵磷脂基本上不影响甲烷水合物生成的热力学条件,但当卵磷脂在水中的浓度超过  $0.003 \text{ g} \cdot \text{g}^{-1}$  时,它会影响甲烷水合物的生成速度和数量,是很好的水合物生成动力学促进剂。

关键词 [甲烷水合物](#) [热力学](#) [动力学](#) [卵磷脂](#) [纯水](#) [促进剂](#)

分类号

## Effect of lecithin on methane hydrate formation

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### Abstract

An experimental study was made to understand the role of lecithin in hydrate formation/ stabilization in drilling fluids. The effect of lecithin on the thermodynamics and kinetics of methane hydrate formation/decomposition in pure water was investigated. Experimental results indicated that lecithin did not significantly affect the hydrate thermodynamic equilibrium conditions. Lecithin was however an excellent kinetics promoter as indicated by a significant increase in the rates and amounts of hydrate formation when the concentration of lecithin was over  $0.003 \text{ g} \cdot \text{g}^{-1}$ .

**Key words** [methane hydrate](#) [thermodynamics](#) [kinetics](#) [lecithin](#) [pure water](#) [promoter](#)

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