

## THERMODYNAMICS

### 原油中石蜡沉积的热力学模型

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**摘要** Most of the crude oils contain waxes which precipitate when temperature drops, resulting in deposition in pipelines and production equipment. It is necessary to set up a model which can predict the wax appearance temperature and the amount of solid precipitated in the different conditions. A modified thermodynamic solid-liquid equilibrium model to calculate wax precipitation in crude oil systems has been developed recently. The assumption that precipitated waxes consist of several solid phases is adopted in this research, and the solid-solid transition is also considered in the modified model. The properties of the pseudo-components are determined by using empirical correlations. New correlations for properties of solid-solid and solid-liquid transitions are also established in this work on the basis of the data from the literature. The results predicted by the proposed model for three crude oil systems are compared with the experimental data and the calculated results from the literature, and good agreement is observed.

**关键词** [waxy crude oil](#) [solid-solid transition](#) [solid-liquid equilibrium](#) [thermodynamic model](#) [wax precipitation](#)

分类号

### Thermodynamic Modeling of Wax Precipitation in Crude Oils

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#### Abstract

Most of the crude oils contain waxes which precipitate when temperature drops, resulting in deposition in pipelines and production equipment. It is necessary to set up a model which can predict the wax appearance temperature and the amount of solid precipitated in the different conditions. A modified thermodynamic solid-liquid equilibrium model to calculate wax precipitation in crude oil systems has been developed recently. The assumption that precipitated waxes consist of several solid phases is adopted in this research, and the solid-solid transition is also considered in the modified model. The properties of the pseudo-components are determined by using empirical correlations. New correlations for properties of solid-solid and solid-liquid transitions are also established in this work on the basis of the data from the literature. The results predicted by the proposed model for three crude oil systems are compared with the experimental data and the calculated results from the literature, and good agreement is observed.

**Key words** [waxy crude oil](#) [solid-solid transition](#) [solid-liquid equilibrium](#) [thermodynamic model](#) [wax precipitation](#)

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