

Microscopic observation of paraffin wax crystal growth inhibition by polymeric additives

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Wax deposition and precipitation in pipelines and sea-lines is one of flow assurance problems. It is commonly known that waxes are composed of n-paraffin which has 15–50 carbon atoms in the chain. Wax crystals are deposited onto the pipeline walls after crystallization which occurs in the oil media. Typically, crystallization process consists of nucleation and crystal growth. When large wax crystals are produced, they can make large agglomerates which would be finally deposited. Therefore, it is necessary to suppress wax crystal growth. Recently, it has been reported that some polymeric additives can act as crystal modifiers or kinetic inhibitors of wax crystals with even a small dosage. In this study, we studied the crystallization event of model wax (n-C₃₂H₆₆) in decane solution by real-time optical microscopy in order to understand the underlying growth inhibition mechanism by ethylene copolymer additives.