Effect of asphaltenes on crude oil wax crystallization

The paper summarizes the experimental work done on asphaltene influenced wax crystallization. Three different asphaltenes (from stable oil, instable oil, and deposit) were mixed at several concentrations or dispersions into the waxy crude oil. These blends were evaluated by viscometry and yield stress measurement and compared with the original crude oil. A complex asphaltene–wax interaction as a function of asphaltene concentration and degree of asphaltene dispersion under dynamic and static condition was observed. The crystallization and the wax network strength was strongly dependent on the degree of asphaltene dispersion. The effect of asphaltenes on the wax appearance temperature (WAT) was examined by polarized light microscopy. The idea that the WAT is a function of asphaltene surface area was introduced and supported by experiment. It was observed that well-dispersed asphaltenes influence the wax crystallization at static condition more significantly than the more flocculated.

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