

# Petroleum Engineering

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## Non-solidification function of wax by the side chain crystalline block copolymer

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Recently, we polymerized a block copolymer that was constructed of two monomers: A monomer with a long alkane side-chain (more than 10 carbon atoms) and another monomer with solvent affinity. This block shows side-chain crystallization. Thus, this block copolymer can crystallize due to its long alkane side-chain (Side-Chain Crystalline Block Copolymer: SCCBC). We found that the side chain block of the SCCBC is adsorbed on PE crystal. At this time, PE crystal and the side chain block of SCCBC are considered to form a quasi-crystalline structure. According to this, the solvent affinity block unit covers the particle and changes the particle surface easy to wet solvent. This is because, SCCBC can act as a dispersant for a concentrated PE particle dispersion. In this time, we added only 0.5 wt% of SCCBC to wax/oil mixture. Without the SCCBC, the wax/oil mixture was solidified at lower temperature, however with adding the SCCBC, the wax/oil mixture was not solidified and we could measure the viscosity and viscoelastic modulus. We also found that the crystalline structure of wax was changed with adding the SCCBC.

### Biography

Shigeru Yao, Doctor of Engineering, now is a Professor of Department of Chemical Engineering, Fukuoka University. He got his Engineering Doctor's degree at Kyoto University. His Doctor thesis is "Viscoelastic Properties of Concentrated Disperse Systems of Polymeric Microgels". Currently, he research focuses on self-organization mechanism of polymer especially the crystalline supramolecular interaction between side chain crystalline block co-polymer and crystalline polymer. He found that by using the interaction, the surface properties of crystalline polymer, such as polyethylene and polytetrafluoroethylene, can modify without any physical treatment. He also focuses on the material recycle of polymers.

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