Physicochemical properties of low dosage hydrate inhibitors investigated by terahertz time-domain spectroscopy

안윤호, 강혜리, 고동연, 이 흔*
KAIST
(hlee@kaist.ac.kr*)

In the oil and gas industries, flow assurance is one of the important issues for safe production. During on and offshore energy development, pipeline facilities could be blocked due to the unexpected gas hydrate formation. To prevent formation of hydrate, many researchers have studied about the properties of gas hydrate inhibitors which have many advantages. Hydrate inhibitors do not change the temperature and pressure condition of flow stream but shift equilibrium line of hydrate formation(thermodynamic inhibitor). Recently, low dosage hydrate inhibitors(LDHIs) which can function as inhibitor at the low concentration have been researched because of its cost effectiveness. In this study, we investigate the properties of polyvinylpyrrolidone(PVP), one of LDHIs, by using terahertz time-domain spectroscopy. From our measurements, transmittance of terahertz radiation through tetrahydrofuran(THF) hydrate + PVP was changed depending on the temperature, weight fraction of PVP, and time scale.