

**Effect of surface modified  $\text{SiO}_2 @ \text{CoFe}_2\text{O}_4$  nanoparticles by methyl on  $\text{CH}_4$  gas -water mass transfer**

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In this study, we determined nanoparticles effect on mass transfer of  $\text{CH}_4$  gas in water. We measured mass transfer every 20 seconds with Gas Chromatography and compared in 3 conditions which include nothing,  $\text{SiO}_2 @ \text{CoFe}_2\text{O}_4$  particles and  $\text{SiO}_2 @ \text{CoFe}_2\text{O}_4$  particles modified by methyl on the surface in water. The result shows nanoparticles enhanced mass transfer and solubility of gas in water. Surface modified by methyl  $\text{SiO}_2 @ \text{CoFe}_2\text{O}_4$  nanoparticle which has both of hydro phobic property and hydrophilic property on the surface made the highest effect in mass transfer and solubility of gas. Acknowledgements: This work was supported by the Human Resources Development program(No.20114010203090) of the Korea Institute of Energy Technology Evaluation and Planning(KETEP) grant funded by the Korea government Ministry of Trade, Industry and Energy and This research was a part of the project titled "Development of Sustainable Remediation Technology for Marine Contaminated Sediments" funded by the Ministry of Land, Transport and Maritime Affairs, Korea.