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## Smart low weight emulsifiers for efficient CO<sub>2</sub> utilization in enhanced oil recovery

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One way to reduce emissions of CO<sub>2</sub> to the atmosphere is to utilize the CO<sub>2</sub> for enhanced oil recovery. In conventional concepts this has required huge amounts of CO<sub>2</sub> in order to cover the cost of installation and operation through increased production. Development of new low molecular weight surfactants with a dual action can make it feasible to also inject CO<sub>2</sub> from smaller point sources. Unlike large polymer surfactants these new surfactant will make efficient emulsions between water and CO<sub>2</sub>. But the formed emulsions are weaker and more dynamic. The emulsifiers contain functional groups that will be active towards aromatic components in the residual oil. This will enable a simple scheme for capture of CO<sub>2</sub>, transport as water/CO<sub>2</sub>/emulsifier slurry to injection in residual oil reservoir. The dynamic release of the emulsifier over to water/residual oil/CO<sub>2</sub> will result in an effect similar to alternating water/gas flooding. The concept is described in details with illustrations from molecular modeling and meso scale modeling. Environmentally friendly use of the produced residual oil is also discussed.

### Biography

Bjørn Kvamme obtained his MSc in Chemical Engineering (1981) and PhD in Chemical Engineering (1984) from the Norwegian University of Technology and Natural Sciences. After a short period with SINTEF and two years at Bergen University College, he was appointed as full Professor in 1987 and started education of MSc and PhD in Process Technology in Telemark. He is appointed as a Professor in Gas Processing at the Department of Physics, University of Bergen in March 2000. He is the author/co-author of 445 publications during last 15 years, of which 154 are in good international scientific journals. He has 2526 citations as per Feb 1, 2018, and has presented numerous papers at international conferences.

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