Danish Offshore Technology Centre
Technology Conference 2022

Synthesis and reaction kinetics of biomass based H_2S scavengers

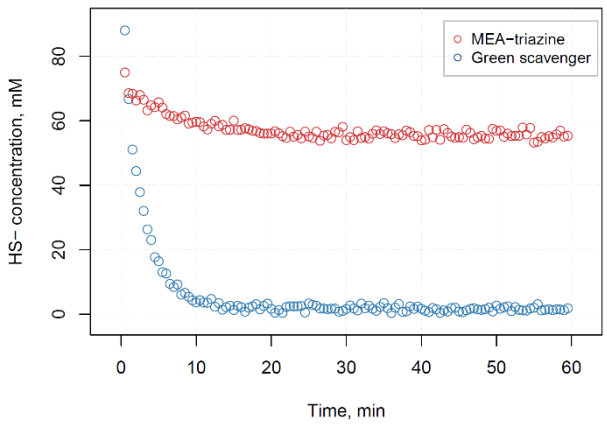
Asger Røikjær Koue [a], Fernando Montero [b], Sergey Kucheryavskiy [b], Marco Maschietti [b] and Christian Marcus Pedersen [a]

[a] *Department of Chemistry, University of Copenhagen*
[b] *Department of Chemistry and Bioscience, Aalborg University*

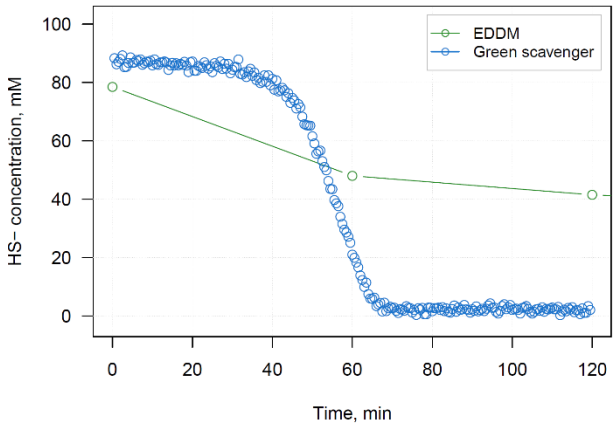
MEA-triazine and EDDM (a formaldehyde releaser) are the most commonly used H_2S scavengers in offshore oil and gas operations, where they are directly injected in the gas and liquid streams, respectively. However, the two major drawbacks of these compounds relate to their significant negative environmental impact due to high toxicity to aquatic life and high propensity to form solid deposits in production and refining facilities. Thus, the development of new "green chemicals" which can reduce the environmental impact and associated operating issues is the goal of this work.

The new "green chemicals" are synthesized from cheap, non-toxic, easily accessible biomass molecules. In the synthesis of the new H_2S scavengers, the chemical properties of the new "green chemicals" can be fine-tuned to include desired functions and properties.

Using *in situ* Raman spectroscopy, the chemical reaction in liquid phase between H_2S and the green scavengers is evaluated and benchmarked against commercial scavengers at different temperature and pH conditions. The monitoring method allows a qualitative and quantitative assessment of the reaction. The most promising green scavengers, which have been synthesized in this work, proved to be able to compete with triazine-based scavengers and formaldehyde releasers.



Comparative plot for scavenging reaction. Initial pH 10 and 75 °C



Comparative plot for scavenging reaction. Initial pH 8 and 60 °C

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