

Experimental simulation of oil-water partitioning of organics during a deep submarine oil spill

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February 5, 2018

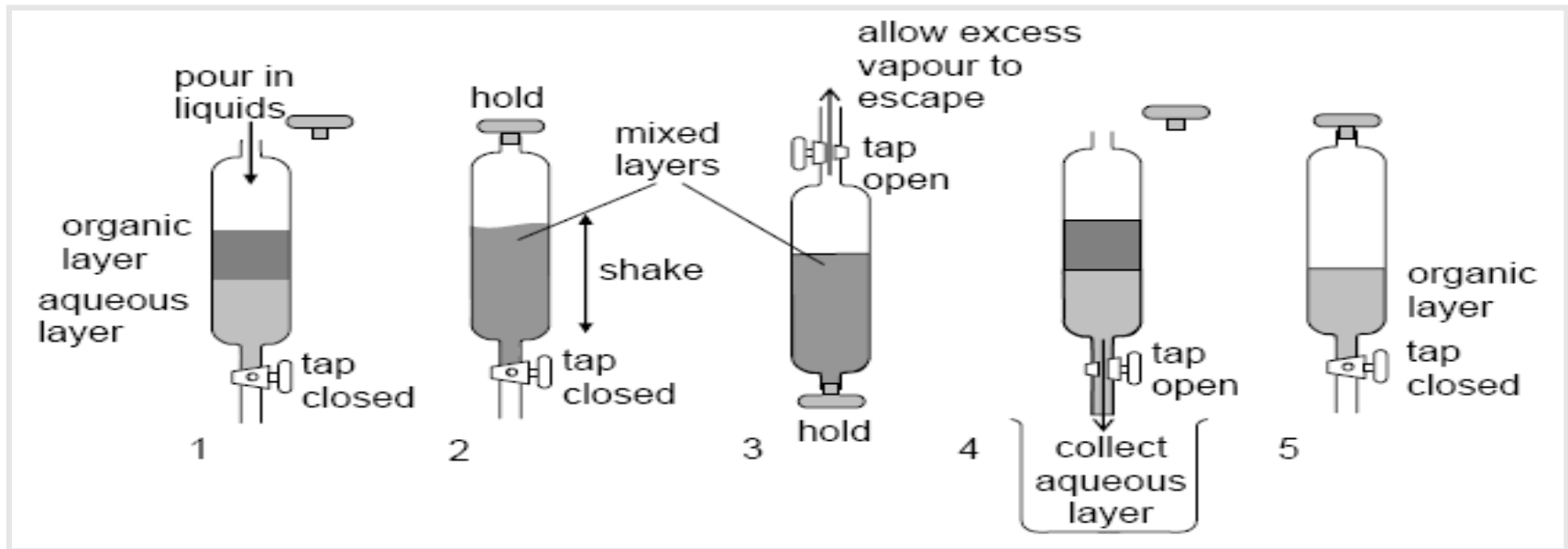
Partitioning of Organic Compounds in the Water Phase



Partitioning of organic species from oil into the water phase

Toxicity analysis, Pollutant Migration Model development, etc.

Research Gaps



(Modified from Manoj *et al*, 2005)

Fails to simulate **High Pressure**

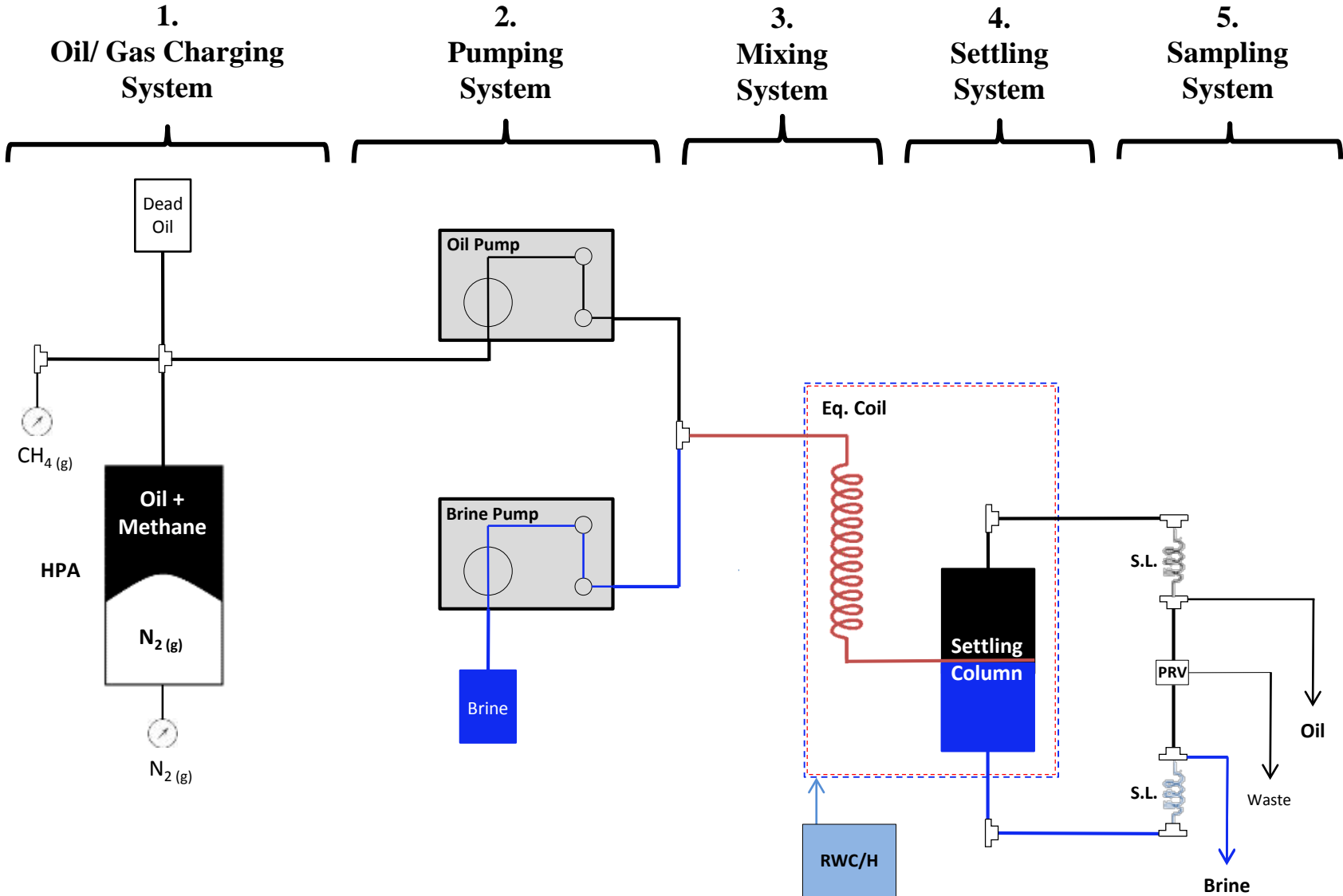
Fails to simulate **Low Temperature**

Fails to simulate **Dissolved Gas**

Partition Device



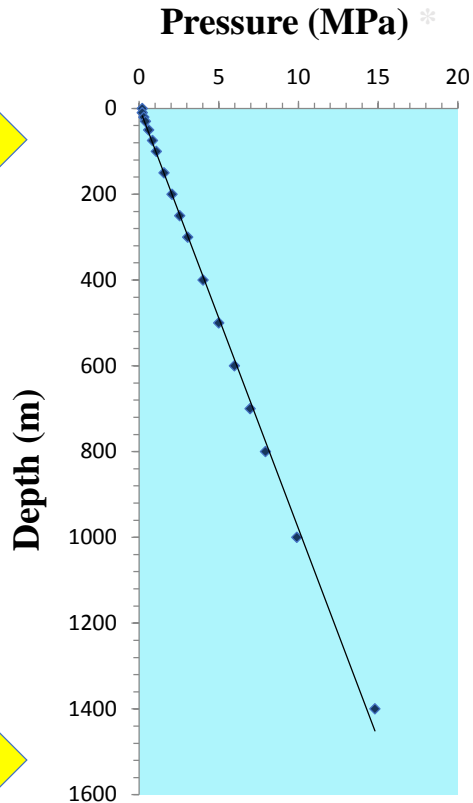
Partition Device- Schematic



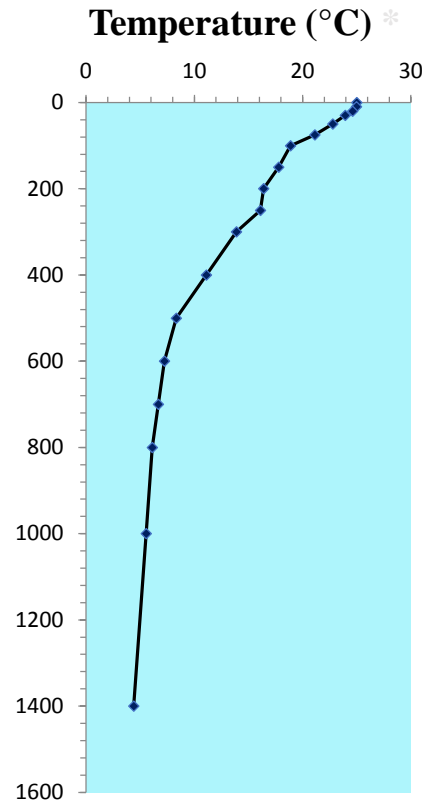
Experimental Conditions

Ixtoc (~50m)

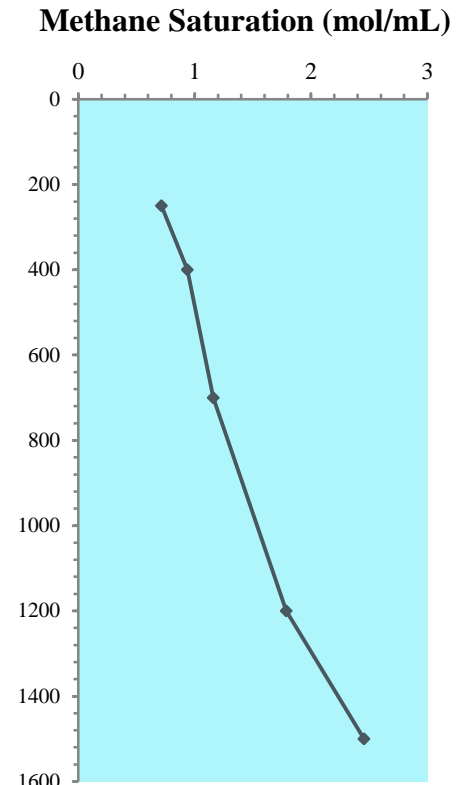
DWH (~1500m)



*Source: NOAA, 2015



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Measured

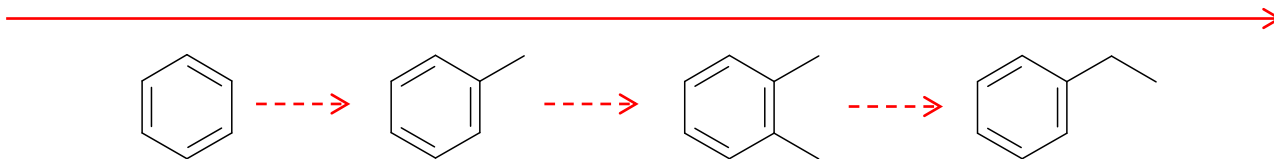
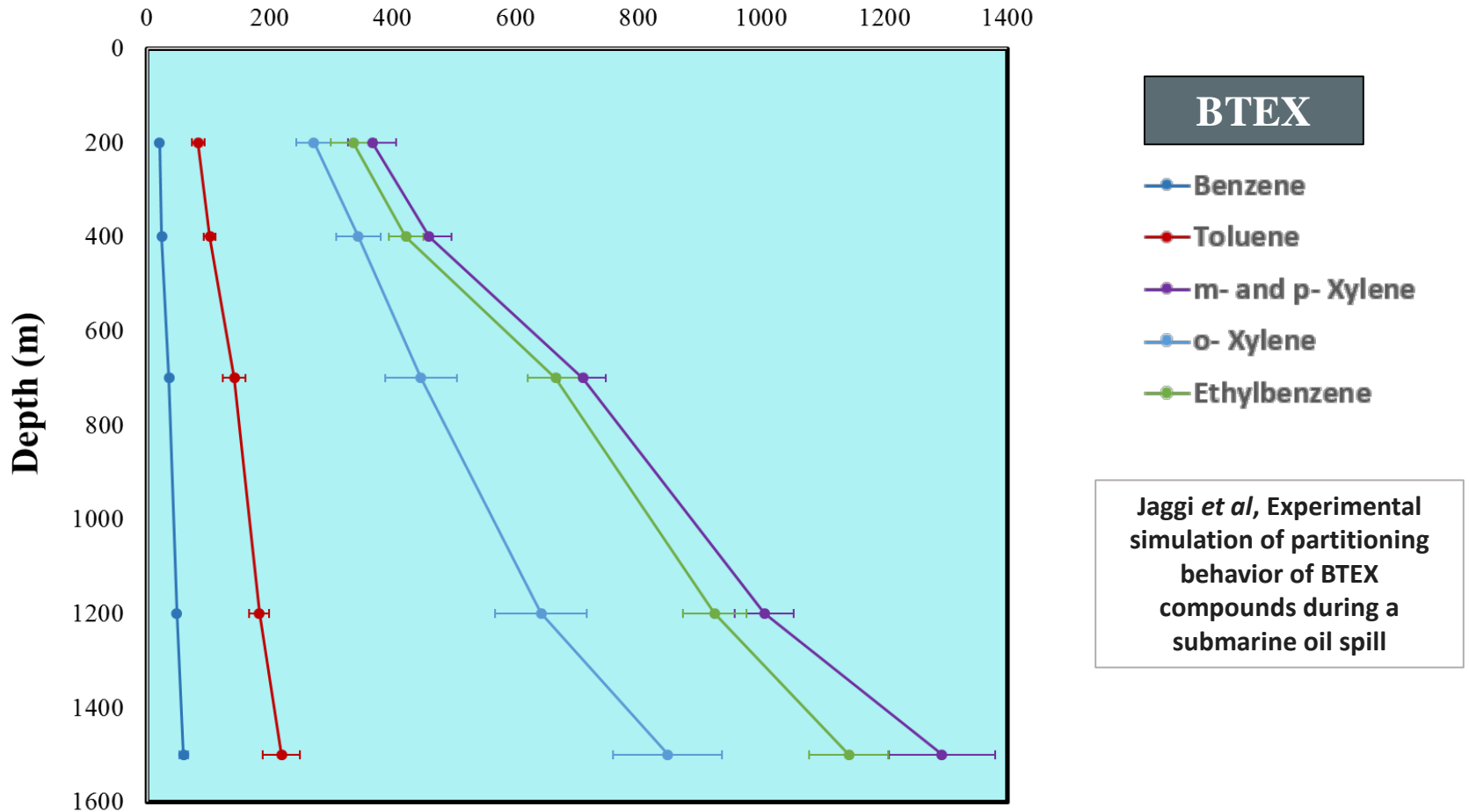
Partition Ratio:

$$P_{ow} = \frac{[X]_o}{[X]_w}$$

where, [X] denotes the equilibrium of the analyte concentration in oil (o) and water/brine fraction (w) after partitioning.

Observed Partitioning trends

BTEX Partition Ratios without dispersants



Potential Technological Advancements

Better Visualization of Partitioning

Sapphire cell for better visualization of oil-water contact and separation

Droplet Size Distribution

Visualize change in droplet sizes

Incorporation in modeling

Integrate the data for fine tuning the models