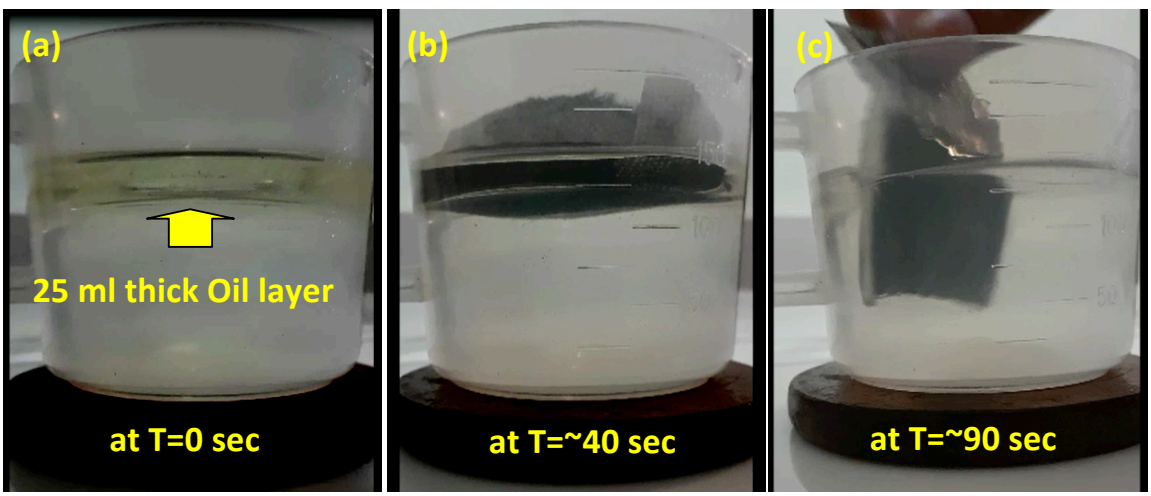
Efficient and selective separation of oil from oil spill

Crude oil often referred to as 'black gold', when refined finds applications as wide variety of useful products such as gasoline, diesel and other various petrochemicals. However, spillage of this natural product into the environment by vehicles, vessel or pipelines due to human negligence, equipment breakdown, natural disasters etc forms a major cause for pollution of water bodies. As oil spills, it floats on water and prevents sunlight from reaching the marine ecosystem. The environmental damage caused often result in both intermediate and long-term environmental damage. In addition to environmental pollution, it also results in huge financial loss. BP oil spillage in the Gulf of Mexico alone in the year 2010 resulted in financial loss of ~62 billion USD. Several different methods used for remediation or confinement of oil spill include use of oil booms, sorbents, dispensers and burning *in situ*.

A novel and economical solution to this has recently been developed at our Nanostructures Engineering and MOdeling (NEMO) Laboratory. The material developed is extremely light and capable of selectively absorbing oil from oil-water mixture up to ~ 20-30 times the weight of the material. One such case study of absorption of rice bran oil is shown in the figure below. This material has been tested on commercially available different varieties of cooking oils and motor engine oil. Further it is possible to recover oil from this by simple compression and is reusable at least 3-4 times with minimal loss in oil up-taking capacity. Also, the absorption process is very fast compared to other techniques.

This innovation is expected to provide much needed respite in removal and recovery of oil from oil spillage into water bodies. In a broader perspective this innovation will not only enable in saving the environment but also help in saving large quantum of money through possibility of oil recovery.



(a) Layer of ~25 ml of oil layer on top of 125 ml of water (b) Partially absorbed oils at an intermediate stage
(c) Entire 25 ml of oil absorbed by the material and remaining 125 ml of water in the tumbler

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