Review of: "On-Line Monitoring of Minor Oil Spills in Seawater Using Sediment Microbial Fuel Cells: A Preliminary Study"

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Potential competing interests: No potential competing interests to declare.

Article titled: On-Line Monitoring of Minor Oil Spills in Seawater Using Sediment Microbial Fuel Cells: A Preliminary Study

This article will inspire more study in this arena as more research is required in this area of MFCs. This article is well-written and provides good information for the reader. This **manuscript still needs some improvement before publication**. The whole study is based on the dissolved oxygen (DO) availability at the cathode, but no data on DO is reported in this study. What happens to the DO when an oil spill occurs in a real water body? What will be the rate of decrement of DO with time at the surface or just below it? The toxic and hydrophobic effects of hydrocarbons on the cathode biofilm and surface, respectively, should have been included in the study. Hydrocarbons add some toxic effects on the microbial culture present on the surface of the cathode.

Specific comments are given below.

1. Authors should add real images of the reactors
2. Equations should not be included in the results and discussion section; keep them in the methods section.
3. No experiments timeline is given in the methods section.
4. Why is a control kept in the OCV?
5. Voltage generation in sMFC would have decreased due to the unavailability of the carbon source at the anode.
6. Surface areas of the anode and cathode are the same, so the cathode is not limiting the reaction; therefore, the anode also plays a role in voltage generation, but the anode is not included in the explanation.
7. Check Figure 2 for the power density as the graph is plotted for voltage vs. current. Where is power density?
8. When was the power density curve generated, and what is its significance?
9. When was the oil drop test performed? On which day of the experiment?
10. An oil drop test is performed after saturating the cathode with DO. What would be the decrement rate of voltage without adding oil?
11. Why were oil volumes of 1 mL, 2.5 mL, 5 mL, and 10 mL used for 60 min each in the same reactors? These volumes can be used in different reactors to get the effect of time on voltage generation.
12. What will be the proportionate amount of a real oil spill corresponding with 1 mL, 2.5 mL, 5 mL, and 10 mL?
13. “As oxygen is the final electron acceptor for the respiration being carried out by microbes at the anode, when oil is covering the air-water interface, the availability of dissolved oxygen (DO) is a limiting factor for the rate at which

electrons can pass through the titanium wire that completes the circuit," as mentioned in the manuscript.

How is this relation stabilized? Dissolved oxygen is not monitored in this experiment. How is the relation between voltage drop connected with the dissolved oxygen?

14. "This can be attributed to the fact that 1 mL of oil was unable to fully cover the interface between air and water, and the amount of oxygen being dissolved varied until more oil was added, at which point it began to stabilize, then decrease rapidly as DO concentration became the limiting factor," as mentioned in the manuscript.

How much oil will be present in real conditions? What will be its implication?

15. "Potential influence of resistance on the biosensing properties of sMFC," as mentioned in the manuscript.

It is not concluded in the conclusion section. Why and what is the effect and significance of the use of different external resistances on the performance of the sMFC?

16. Authors should change Conclusion to Implication and Limitation