

Supplementary Materials

# Simulation and Experimental Analysis of Microalgae and Membrane Surface Interaction

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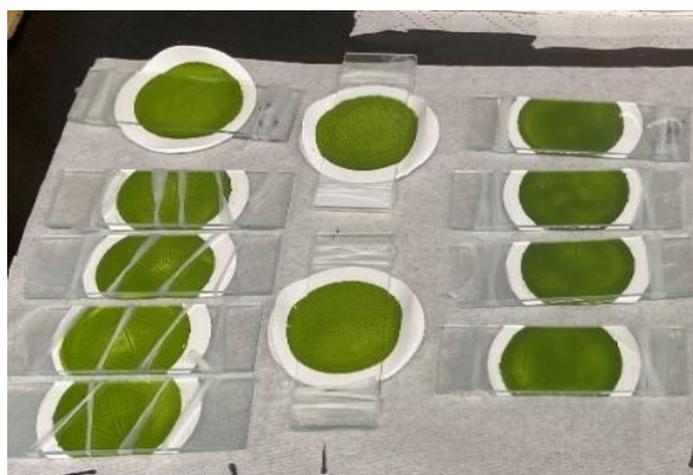


Figure S1. surface of filter paper covered with algae.

## 1. Measurement of Liquid Surface Tension

Diiodomethane, formamide and water were selected as the probe liquids and the surface tensions were shown in Table S1.

Table S1. Surface tensions (mN/m) of three probe liquids. [1].

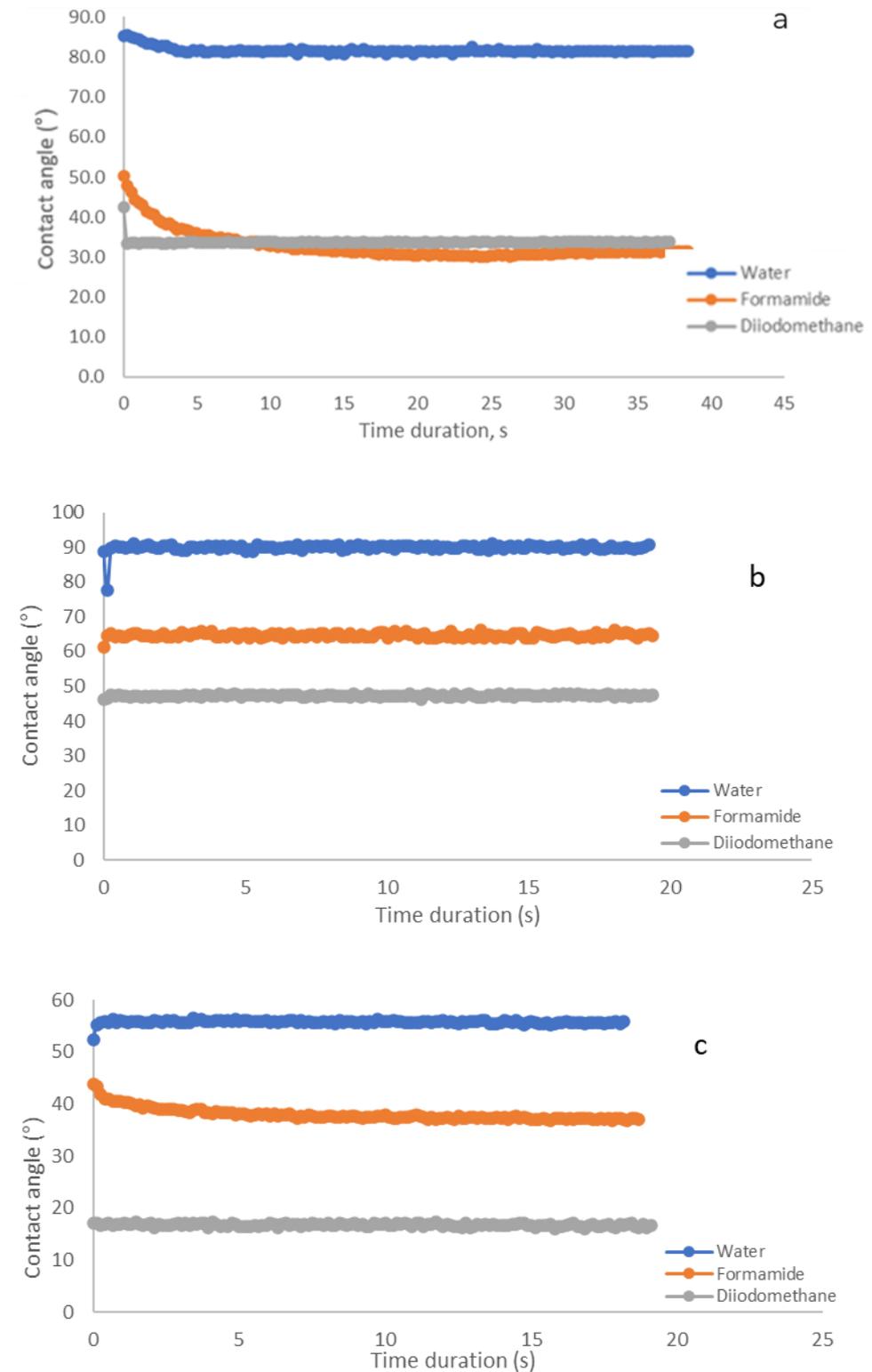
Probe liquids	$\gamma_l^{LW}$	$\gamma_l^-$	$\gamma_l^+$
Water	21.8	25.5	25.5
Formamide	39.0	39.6	2.28
Diiodomethane	50.8	0.0	0.0

## 2. Adsorption Analysis

Before measurement, the sensors of the QCM-D instruments were cleaned by treating them in a UV/ozone oxidation cleaner (PSD Series, digital UV ozone system) for 15 min, followed by immersion in the 2 wt.% SDS solution for 2 h. Subsequently, the sensors were rinsed thoroughly with Milli-Q water and applied nitrogen gas to dry them. QCM-D adsorption experiments were conducted on the sensors by firstly introducing Milli-Q water buffer for 5 min to establish a stable baseline. Then, microalgae solution was introduced to the flow chamber, and frequency and dissipation changes were monitored. The fundamental frequency of the crystal sensor at the 5<sup>th</sup> overtone was monitored. After that, the sensors were rinsed with Milli-Q water for 3.5 minutes to monitor desorption. The pump rate of 0.15 mL/min and temperature of 20 °C were set throughout all QCM-D

experiments. The generated data was fitted into the Sauerbrey equation. The density and fluid viscosity were assumed to be  $0.99 \text{ g/cm}^3$  and  $1.05 \text{ mPa}\cdot\text{s}$ , respectively.

### 3. Contact Angle of Microalgae



**Figure S2.** Contact angle of diiodomethane, formamide and water (a) on the surface of microalgae; (b) PDMS, (c) PU sensor.

## Reference

1. Yu, G.; Cai, X.; Shen, L.; Chen, J.; Hong, H.; Lin, H.; Li, R. A novel integrated method for quantification of interfacial interactions between two rough bioparticles. *J. Colloid Interface Sci.* **2018**, *516*, 295–303. <https://doi.org/10.1016/j.jcis.2018.01.075>.