

Online Monitoring of Transparent Exopolymer Particles by a Novel Membrane-based Spectrophotometric Method

What is TEP?

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- Transparent, sticky and gel like substances, excreted by phytoplankton and bacterioplankton. It is mainly comprised of acidic polysaccharides.
- Associated with algal growth and have adverse impacts to water treatment systems.

Novel TEP monitor

- An optic fibre spectrophotometer and a UF crossflow filtration system.
- TEP is collected on the UF membrane surface and stained using Alcian blue.
- Colour intensity on surface is quantified using the reflection probe, represented by the CIE L*a*b* colour space.
- b* appears to be more negative with the presence of TEP.

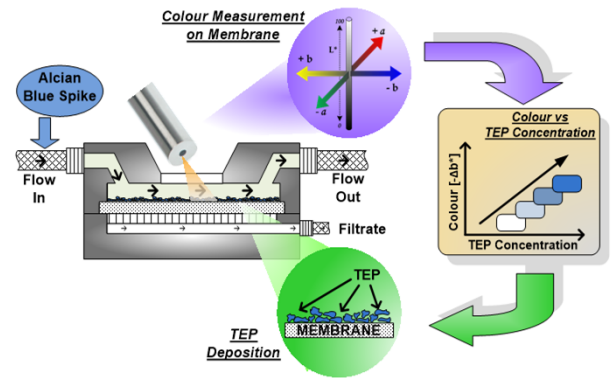


Figure 1: Schematic diagram of TEP monitor

Correlation of b* and Xanthan Gum

- The b* value is linearly related to XG concentration.
- Membrane is regenerable using NaOCl without compromising the accuracy of measurement.

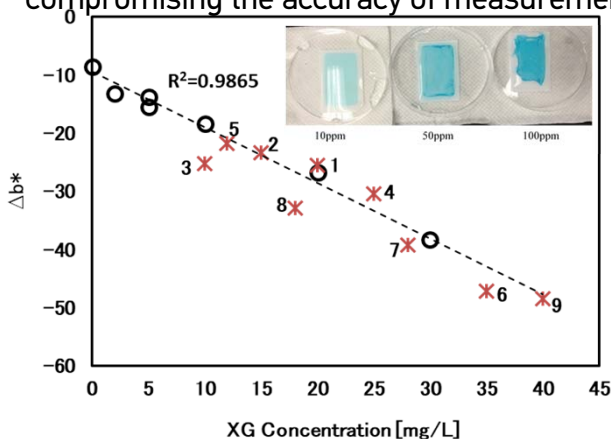


Figure 2: Calibration between Δb^* and XG concentration (o). The red stars (*) are the TEP measurements obtained after each cycle of membrane regeneration.

TEP production during algae growth

- TEP sensor shows an obvious TEP release during the growth of algae, whilst conventional TEP method only have slight variation.

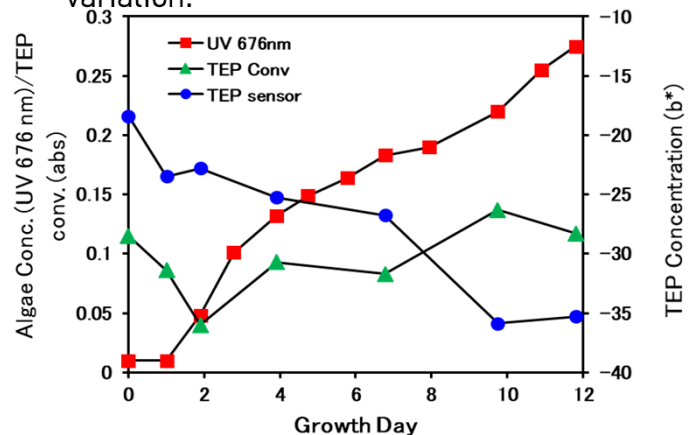


Figure 3: Changes in cell density, conventional TEP (TEP > 0.1 μ m) and TEP sensor (TEP > 30kDa) measurements during the incubation period of batch culture of *Thalassiorra Pseudonana*.

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The Singapore Membrane Technology Centre (SMTc) is supported by the Economic Development Board (EDB) of Singapore