

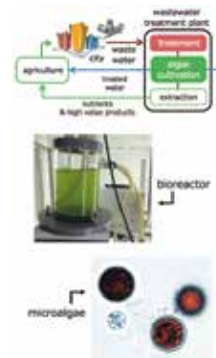


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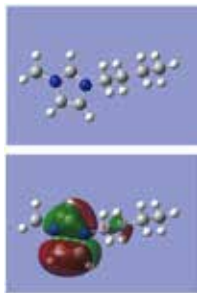


Wastewater to food production ~ a new wastewater treatment process with resource recovery

We are working on wastewater treatment process that is economically beneficial, and resources in wastewater are recovered and recycled for sustainable food production. Fertilizer including phosphorus is necessary to produce food. The demand of the fertilizer has been increasing to supply food for increasing population. However, fertilizer reserve is limited, and its production causes environmental pollution. To protect the environment and supply enough food for our children, we have been developing a new wastewater treatment process not only to treat the wastewater but also recover nutrients for fertilizer. More than that, we have been trying to increase the "value" of the recovered products using microalgae. This microalgae produces carotenoids such as b-carotene and astaxanthin, those are high value antioxidative pigments and are dealt with at a high price. The production of the pigment is the economical driving force of recovering nutrients from wastewater, finally to establish the sustainable food production.



Understanding of chemical and biological reaction mechanisms by computer simulation



Computer simulation is a powerful tool to understand the mechanism of reactions such as degradation of pollutants in water treatment process, and oxidation reactions in microbial cell. Using the computer skills and the knowledge of physical chemistry including thermodynamics, we have been doing the simulation researches. One of the example is the degradation of ionic liquid with ozone. From which chemical bond does the degradation reaction occur? The simulation gives us the insight of the reactions.

