

## Hydrogen production using natural seawater in the enzymatic PEC system

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Realization of hydrogen production requires sustainable manner and the most abundant natural resource on earth. Therefore it is thought that the most attractive source is seawater as electrolyte for photoelectrolysis. In our water split system using artificial solar light we have utilized various seawater types which is concentrated through NF or RO membrane. We have found that the chlorine ion play a key role in scavenging hole among ions included. In order to increase the amount of hydrogen biocatalyst called as *Pyrococcus furiosus* has been immobilized on TiO<sub>2</sub> surface and solar cell 2.0V as external bias has been applied to optimize energy level of electron transferred to cathode. hydrogen was evolved from the enzymatic PEC system, recording more than 100 μmol of H<sub>2</sub> / (hr×cm<sup>2</sup>, ATTE) under the Xe lamp.