H2 PURUS

HYDROGEN PRODUCTION TECHNOLOGY

Principles Of Our Method

- Our proprietary reactor utilizes sonolysis to produce hydrogen directly from seawater.

Key Process

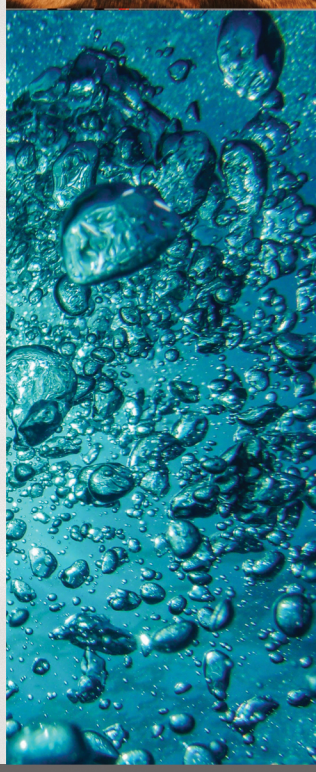
- Ultrasonic waves generate reaction in the water.
- Rapid expansion and collapse is induced by this reaction due to pressure changes.
- The collapse creates extremely high temperatures (thousands of Kelvin) and high pressures (thousands of atmospheres) on a microscopic scale.
- These extreme conditions are sufficient to break the molecular bonds of water (H_2O).

Thermodynamic Feasibility

- The extreme conditions generated by our ultrasonic process overcome the energy barrier of water dissociation.
- This ensures that the process is thermodynamically feasible and highly efficient.
- The reactor achieves energy optimization through calculated parameters, enabling continuous and scalable hydrogen production.

Advantages Over Electrolysis

- **Lower Energy Consumption:**
  Consumes significantly less power (34 kWh per 1 kg of hydrogen) compared to traditional electrolysis.
- **Direct Seawater Utilization:**
  Uses seawater without requiring pre-treatment or desalination.
- **On-Demand Hydrogen Production:**
  Operates instantaneously when coupled with a continuous electricity source.
- **Cost-Effectiveness:**
  Simplified process reduces energy and infrastructure costs.



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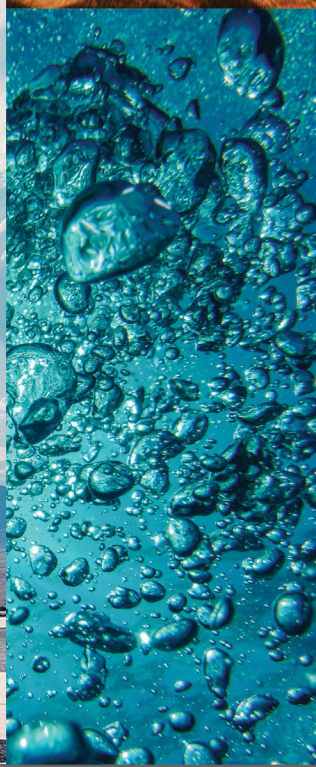
Environmental and Economic Impact

- **Zero Emissions:**
  Produces green hydrogen with zero carbon emissions.
- **Resource Efficiency:**
  Direct seawater utilization removes the need for freshwater consumption.
- **Energy Independence:**
  Enables decentralized hydrogen production for energy security.
- **Cost Savings:**
  Reduced operational costs compared to electrolysis.

Conclusion

- The calculated parameters ensure that the necessary conditions for water dissociation are consistently achieved.
- Our design is fully scalable, adaptable to both small-scale and large-scale hydrogen production needs.
- Combines sustainability, efficiency, and cost-effectiveness, paving the way for a hydrogen-powered future.



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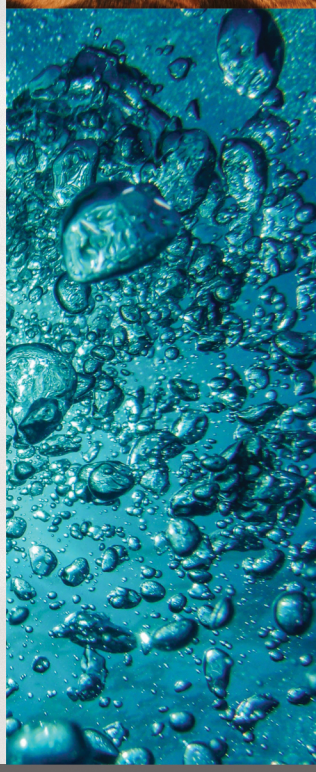
Cost and Sustainability Advantages

- **Lower Operating Costs:**
  Our method requires 30% less energy per kg (41% increase in hydrogen output) than electrolysis and eliminates the cost and energy use for water desalination or purification.
  Reduces dependence on freshwater resources.
- **Environmental Benefits:**
  Electrolysis relies heavily on freshwater, which may not be sustainable in water-scarce regions.
  Our method utilizes seawater, which is abundant and avoids environmental concerns related to freshwater depletion.
- **Scalability and Feasibility:**
  Electrolysis methods, especially PEM and alkaline, face limitations in scalability due to high energy and water input requirements.
  Our method's compact reactor design is modular and ideal for scalable hydrogen production.
- **Energy Consumption Comparison**

Method	Energy Consumption (kWh/kg)	Water Requirements
Our method	34	Seawater
PEM Electrolysis	50-55	Desalinated/Fresh water
Alkaline Electrolysis	48-55	Desalinated/Fresh water
Solid Oxide Electrolysis	40-45	Desalinated/Fresh water



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