

Novel Alternative Energy: Seawater Electric Generator Improved by the Catalyst from Waste Lard

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Over 1.3 billion people in the world were living without electricity. Not only has the insufficiency of electricity been causing problems but the main source, fossil fuel, has also been one of the world's most concerned issues. In this project, a novel alternative energy source utilizing seawater as a renewable resource to generate electricity was introduced. The efficiency of the generator was dramatically enhanced using iron nanoparticles on carbon as a catalyst. The catalysts were synthesized from scrap iron and lard via solution plasma process (SPP) using voltage of 1.5 kV under atmospheric condition for 50 min at different arc discharge frequencies from 15 to 30 kHz. The catalysts were then characterized to evaluate its suitability for the generator. The results suggested that sample synthesized at 15 kHz was the most efficient catalyst. When only 0.6% of the cathode area was covered by the catalyst, the generated power was increased up to 20.8%, compared to those without catalyst. Furthermore, a 5 parallel-cell generator using specific catalyst provided the maximum power of up to 151 mW, which was enough to drive a small ship prototype. It is foreseen that the utilization of our seawater electricity generator would be the first promising step. These ships would be able to sail as long as it is surrounded by seawater. In the future, this idea can be applied in a seawater power plant generator to meet an increasing demand of electricity in the world.

Awards Won:

American Chemical Society: Certificate of Honorable Mention