Science Tech Entrepreneur
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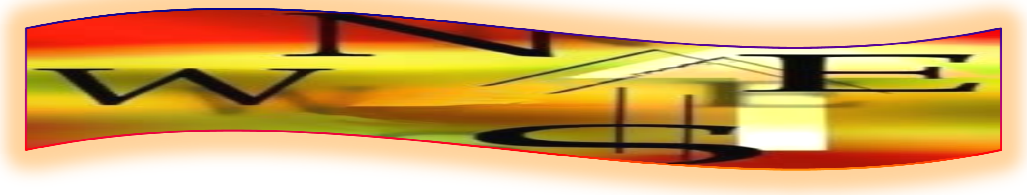
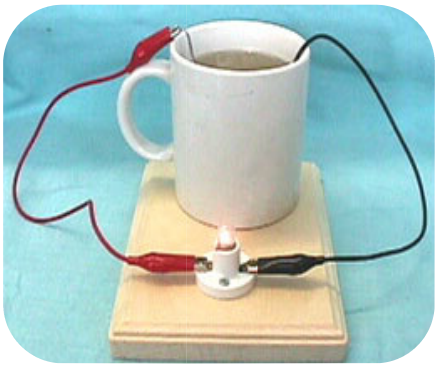


Electricity from salt water

We all know that the world is now facing an energy crisis and everyone is trying to do something about that. In search of alternative sources of energy, we can show that electrical energy or electricity can be made from air and saltwater. In the first hand generating electricity from salt water seems to be so simple but it is not like that.



Air-salt battery: Experiments with different concentrations of salt water, different temperatures, and different electrodes may turn up unsuccessful. But if the experiments are performed in a well planned manner with suitable materials then enough electricity to light up a small light bulb can be generated at laboratory project level itself. The concept is easy. The same way that we burn wood and make heat energy, we should be able to burn metals and get electricity (or electrical energy). The difference is that we are not really burning anything; instead, we are producing a condition for oxidization which by itself is the same as slow burning. So what is to be done is to oxidize iron in saltwater using the oxygen from the air or any other source. Still the method of generating electricity from salt water is not evaluated for its economical and cost effective suitability but it is only taken as an alternative method of producing electricity. Moreover, this method will be more beneficial to people of costal area well equipped with enough salt and facing power shortage from conventional sources of energy.

List of materials needed for the experiment: Miniature light bulb (low voltage, low current), miniature base for light bulb, pair of insulated solid copper wire awg=20,

pair of alligator clips, magnesium electrodes, iron electrodes (note: steel is about 98% iron), a cup of saltwater and screws for the miniature base.

Additional optional materials: A wooden board to mount the miniature base (light holder), plastic container about 4" x 4" x 4" and hydrogen peroxide.

Procedure

1. Remove the plastic insulation of about one inch from both ends of the wires.
2. Loosen the screw on both contacts of the bulb holder. Place one end of the red wire under one screw, make a loop and then tighten the screw.
3. Pass the open end of the red wire through the arm of the red alligator clip and secure it under the screw.
4. Pass the open end of the black wire through the arm of the black alligator clip and secure it under the screw.
5. Screw the light bulb on the miniature base.
6. Connect the red alligator clip to the iron electrode and secure it on one side of the plastic container or the cup.
7. Connect the black alligator clip to the magnesium electrode and secure it on the opposite side of the container. (You may need to hold them by hand or use a small tape to hold them in place on the side of the container).
8. In another pitcher, prepare some strong, warm salt water. Add enough salt, so at the end some salt will be left at the bottom of the pitcher.
9. Transfer the salt water from the pitcher to the container.
10. At this time, if all the connections are secure and the electrodes are large enough, you should get a light.

Tips to improve the performance of battery

- The test tube electrodes (magnesium electrodes in test tubes) are formed like a spring. This provides the largest possible surface contact. Iron electrode may use steel wool as steel wool has a very large surface contact. A steel screen may work as well.

- **It is noticed that more electricity is being generated if the solution is thorough and continuously being stirred during the experiment. Even, removing the iron electrode and inserting it back again produces more electricity. Such actions provide oxygen to the surface of the iron.**

- **The oxygen in the air may not be enough to complete oxidation process thus, getting a dim light. In this case, some oxygen (in the form of hydrogen peroxide) may be added to the salt water that should immediately increase the light.**

- **Instead of a cup, a larger container of salt water will give better result. In a larger container, it is easier to secure the electrodes in two opposite sides so they will not touch each other.**

India to deploy more Doppler radars for weather forecast

India will soon have more home-grown Doppler radars deployed at strategic locations across the country for weather forecast and climatic conditions.

'Initially, four Doppler radars will be deployed, with the first one next year at Cherrapunji in the north-east for monitoring cloud formation, wind movement and weather forecast in the eastern region,' former Indian Space Research Organisation (ISRO) chairman G. Madhavan Nair said. Similarly, three other Doppler radars will be located in the western, northern and southern regions to assist the Indian Meteorology Department (IMD) monitor weather.

A Doppler radar makes use of the change in wave frequency to generate data on objects at a distance by beaming a microwave signal towards a desired target and recording its reflection. The weather radar has been named after Austrian physicist Christian Doppler who pioneered it in 1842. Variations in the frequency of the signal give accurate measurements of a target's velocity relative to the radar source and the direction of the microwave beam. Doppler radars are also used for other civil and military applications such as air traffic control, air defense, sounding satellites, and police speed guns and radiology. ISRO is working with the IMD to deploy the first Doppler radar at Cherrapunji in Meghalaya, as the location is the world's wettest place on the earth for receiving the highest rainfall in a year.

A win-win situation- thanks to ornamental fish breeding

The women in Venkatanahalli a peri-urban village, close to Bangalore International Airport are actively involved in dairy, goat, sheep rearing, preparation of value added products, petty businesses and making leaf plates. Many support their family in agricultural activities. Prominent among them is Mrs. Narayanamma, an established ornamental fish breeder and role model for many women in the region. The University of Agricultural Sciences (UAS) and IOWA State University of Science & Technology, U.S., funded a training programme on ornamental fish farming modules for rural farm women. The women learnt to make live feeds such as daphnia, mosquito larvae, earth worms, and fruit flies and dry feeds —pellets, flakes and egg-custard — using locally available inputs.

The success of Mrs. Narayanamma and her group stimulated several SHGs from neighboring villages in the past couple of years to try their hands in rural ornamental fish rearing, "as it is emerging as a popular income generating activity among women

"Initially we provided four circular cement rings each of 500-600 litres capacity, live food, production tank of 150 litres capacity, covering net, plastic tubs, hand nets and plankton nets to the women and supplied parent stock of different varieties of fishes such as mollies, guppies, platys and sword tails to enable them to develop their own breeding programs," says Dr. D. Seenappa, Chief Scientific Officer, Inland Fisheries Division, Main Research Station of the University. Live feeds "Thanks to the guidelines given to us by the Department of Inland Fisheries Division, University of Agricultural sciences, Bangalore, I earn Rs, 3,000 to Rs. 4,000 a year by growing ornamental fishes in my backyard," she says.

Throughout the rearing period of 40-60 days the women continued to apply the manure on alternate days and partial water exchange (4-5 times) after the first month depending on the water's colour. All the women harvested about 120-130 marketable sized fish and sold them to buyers at a farm gate price of Rs.3- Rs.5 per fish. It is a win-win situation for both the farmers and the Inland Fisheries Division.

Plastics may one day power your laptop!

A new research has indicated that instead of dumping plastics, they could be recycled to make useful products such as rechargeable cell phone or laptop batteries and other useful products like tones and lubricants. Vilas Pol of Argonne National Laboratory in Argonne, Ill, has found a way to turn plastic into tiny spheres of pure carbon just a few microns across and then use them in tires, batteries and lubricants.

In tyres for instance, it could dissipate the heat generated from friction against the road, protecting the rubber from melting. Pol's method involves heating plastic till it turns into gas inside a sealed chamber. Instead of air, inert gas is fed into the chamber, which releases the hydrogen in the plastic. This hydrogen gas can be used as hydrogen fuel. The carbon, meanwhile, which forms spheres or egg-shapes depending on the type of waste plastic used, could be useful for certain applications, like filtration, where packing tightly together is vital.

"Microspheres are expensive to make using the current technology," Discovery News quoted Nishkamraj Deshpande of the United Space Alliance, a NASA contractor, as saying.

"With this process, we don't have to invest new petroleum gases to make carbon spheres or nanotubes," Pol said.

Carbon microspheres are also useful in lubricants, toner, paint and filters. "It's cost effective. It is reproducible," he added.

Source: Dr. S. S. Verma Department of Physics, S.L.I.E.T., Longowal, Distt.-Sangrur (Punjab)-148 106, E-mail: ssverma@fastmail.fm, www.indiaenews.com, www.thehindu.com, www.dnaindia.com

Note: The author may have used various references in the preparation of this article. For further details please contact him/her.