SOLAR POWER TO ENERGY – NEW PROCESS

Up to a few weeks back we knew only of a handful of processes to harness the immense sources of energy transmitted onto the earth surface. All forms of energy except perhaps nuclear energy, originated from the sun. (Sun it self is a huge nuclear reactor, come to think of it!) We have been converting this radiant energy to a form usable in a traditional application. But since time immemorial the most efficient conversion process has been photosynthesis by plant life with chlorophyll. However much tried we have not been able so far to duplicate this seemingly simple chemical process.

However the latest news coming out from the Swiss and US solar researchers labs is that a new process has been developed which uses Water, Carbon dioxide and solar energy, to duplicate photosynthesis in a way (though not exact). As you know Hydrogen is the most efficient combustible fuel known to man but hitherto has not been able to produce or store safely and economically. Though not an exact copy of photosynthesis, the new process at least to a certain extend mimic it and provide high energy fuel of Hydrogen along with Carbon monoxide as end products.

The Hydrogen is expected to be used in fuel cells or as Syngas along with the Carbon Monoxide produced.

The device

Millions of hectares of green vegetation covering the earth’s surface is our life blood. They provide energy, clean our atmosphere, provide Oxygen for us to breath, keep the
surface soil bound and many other known and unknown benefits. Our present technology is not yet competent enough to provide all these to us.

The new system that only partly mimic the natural process consists of a concentrated solar radiation collector, Porous Ceria (Cerium Oxide) lined vessel which is insulated with Alumina (ie. the simple salt aluminium oxide), an inlet to the vessel interior for Carbon dioxide and water and an outlet at the bottom for hi efficiency fuels Hydrogen and Carbon Monoxide. The metal oxide Ceria is a rare earth element but is about the commonest in nature in the series.

The Process

Metal Oxide Ceria is a salt with a peculiar property. It imbibes oxygen when it’s temperature rises and releases oxygen when cools down. What the new device does is that it absorbs the heat from the concentrated solar radiation which passes through the quartz cover of the device. Porous ceria lines the inner surface of the chamber to which CO2 and Water is entered. The end products are Hydrogen and Carbon monoxide, both efficient fuels.

Currently the problem with Photovoltaic Solar panels and Thermal Solar panels is that they are static and the collected energy is difficult to transport or stored enmasse. The high efficient fuels of the new process earmarked for future environmentally friendly automobiles, air craft, industrial processes etc. provide ways to store them close by outdoors as well as within the place/machine of usage.

Just like for any volatile fuel or chemical these high energy fuels too will have to be stored or transported with extreme caution and due safety measures observed.
It is expected that the new device will provide solutions for many a current problem experienced with renewable energy usages. The major draw back presently is the low efficiency of the device. Swiss and US Scientists who are involved in this invention expect to have a break through in this regard soon.

Interestingly this machine can also be used to produce Methane too, another fuel whose energy content is less and easily adopted for domestic energy applications.