

Photovoltaic Cell

My Name is Dhaval Panchal (By profession I am an Electrical Cable Design Engineer)

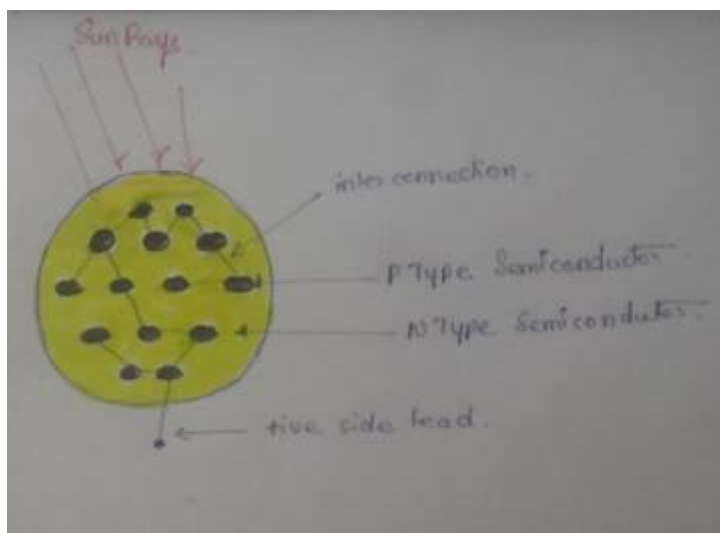
I have a keen interest in renewable energy sources, especially solar photovoltaic cells; I suppose you might be the perfect person to have a look on my idea. I have actually been thinking over the solar cells since more than 3 to 4 years, and have felt some basic questions that:

- Why has the basic design of solar cell not changed?
- Why is it still a flat surface for 70 years of its inception?
- Why is the efficiency of the cell so limited?
- Why doesn't the cell mature after so much of research?
- Why do we increase the intensity of sunlight (by magnifications) just to improve the efficiency of the PV cells?

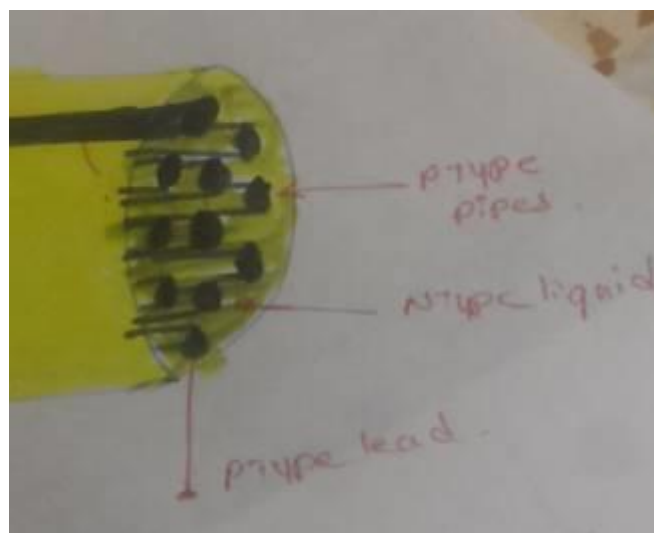
I suppose there is some problem with the design itself. I want you to have a look on it, what if we can make it a cylinder pipe like structure instead of a flat surface.

Imagine a long cylinder (huge pipe) filled with a liquid of N type semiconducting material and having small diameter rods of P type inside – immersed in the liquid. Leads of Positive side and Negative side coming out of it – one from the liquid N Type surrounding and other from the solid P type bars Immersed in the liquid.

Have a look here (P.S. My drawing is very bad)



(Front View)



(Side View)

The basic working of the photovoltaic cell shall be fundamentally fulfilled, the only difference here shall be, that one side shall be in solid state and other side shall be in liquid state.

As the liquid immersed will be an "n type" semiconducting material, the light (i.e. photons) would easily pass through it as the opacity of this liquid would be much lower than that of conventional solar cells.

And the electron disbursement as compared to that of the flat surfaced solar PV cells would also be much higher, which indirectly means more EMF – more voltage.

But again we have issues of high melting solids requiring temp more than 1200 deg C to melt and maintain in liquid form. Secondly, the n-type liquid will be transparent to light which would mean that the material you will choose will be of high band gap.

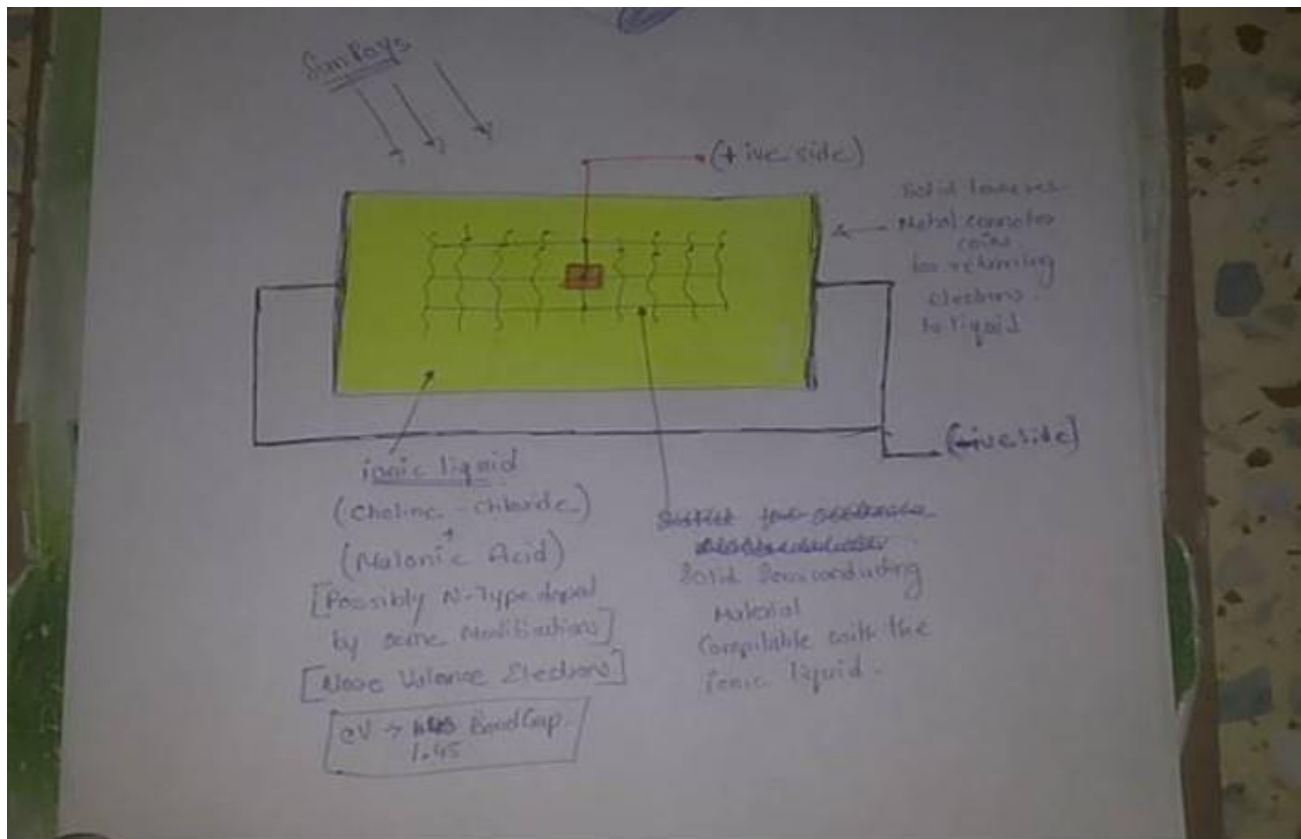
Accepting all the disparities please see the below **Primitive Draft Prototype**, The Liquid of "choline chloride malonic acid" as noted in many articles (as anticipated by me) exhibits properties of a Cadmium Telluride semiconductor.

It may be possible to obtain photovoltaic properties by a combination of the liquid immersed in a wire mesh of a solid semiconductor, and pulling out terminals as shown below.

The working would be as simple as that of a conventional PV solar cell.

The liquid shall be "N Doped" – the excess of the electron/electrons may be released on fall of sun rays and these electrons shall be captured by the solid semiconductor wire mesh (Possibly "P Doped"), and thus a flow of electrons may be obtained.

The efficiency levels shall be high due to more mobility in atoms of this liquid rather than that of solid (in case of conventional silicon cells).



Would be pleased if your valuable comments / appreciation is given on the above abstract.

Incase if you find me worthy, I request you to give me a chance to work with you.

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