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How is hydrogen fuel manufactured?

How is hydrogen fuel generated from solar power...

What is the process and how huge it is..

What are the links which would narrate the process with neat sketches

Could it be made in home or any local place..

4 days ago (2009-09-30 00:52:32) - 4 hours left to answer. (2009-10-04 00:52:32)

 [smineshb...](#)

Answers (7)

Generally, electrolysis is the process. Using a battery, submerge both negative and positive electrodes into water. Capture the escaping gas

Source(s):

<http://en.wikipedia.org/wiki/Electrolysi...>

<http://bioage.typepad.com/photos/uncateg...>

4 days ago (2009-09-30 00:58:24)

 [Grumpy Old Man](#)

oh ! grumpy old men thanks for such a nice link

4 days ago (2009-09-30 03:23:15)

 [Atul](#)

Take a look.

You will find ammonia production technologies(it's a way to store hydrogen).


It includes electrolysis process for hydrogen production.

<http://www.iffco.nic.in/applications/iffcowebr5.nsf/0/4c4c41bda8dce6c7652570c40047bd41?OpenDocument>

4 days ago (2009-09-30 06:07:49)

 [From Mercury](#)

People think that hydrogen from water is a good idea because we've all seen electrolysis demonstrated in grade school experiments. The fact is that it's terrible as an automobile fuel. It leaks, it's a gas, it's voluminous and the electrolysis process isn't very efficient.

 [John W](#)



Of course, the idea of temporarily storing energy from clean sources such as solar for use in vehicles is an attractive one and Sandia has had a research program to find more efficient ways of producing hydrogen from water.

 [Sandia](#)



Contributing In:

They came up with the GR5 reactor which used a solar furnace to heat cobalt oxide counter rotating discs to 2400 Celsius at which point the cobalt oxide gives up it's oxygen atoms, then as the discs rotated out of the solar furnace, they cooled to 2000 Celsius and would grab the oxygen atom out of the water being blown as steam onto it leaving hydrogen gas.

[Alternative Fuel Vehicles](#)

[Green Living](#)

This worked well but the scientists realized that it would also grab an oxygen atom out of any CO₂ blown on it and it's been well known since the 1920's that if you have hydrogen gas and carbon monoxide gas, you could synthesize any linear hydrocarbon in a process called Fischer Tropsch synthesis. Indeed, Shell dilutes it's refined diesel with Fischer Tropsch synthesized diesel to meet the new ultra low sulfur diesel requirements and the tar sands of Alberta were "upgraded" by burning the low quality bitumen in a low oxygen environment to produce hydrogen and carbon monoxide gas from which they would synthesize high quality products like gasoline and diesel from.

This meant that the CR5 process could just as easily produce gasoline or diesel as it could hydrogen, achieving the same goal of temporarily storing clean energy from solar power for use in vehicles instead of releasing carbon from fossil reserves. Using synthetic gasoline avoids the problems of hydrogen storage and avoids the environmental costs of manufacturing new vehicles and constructing a new infrastructure.

The conclusion was yes, we could make hydrogen from water more efficiently than electrolysis for a hydrogen economy but it would be better for the environment if we made gasoline from water and CO₂ using the same clean energy source therefore the concept of a hydrogen economy is redundant from an environmental point of view.

However, the hydrogen economy concept is easy to market to uninformed people as everyone has seen the grade school electrolysis demonstration and the requirement for new vehicles, although damaging to the environment results in growth for the automobile industry hence profits

Another interesting detail is that hydrogen and carbon monoxide gases can be made in a carbon negative way if biomass is gasified with the charcoal byproduct sequestered as biochar so the entire synthetic gasoline use scheme could actually remove CO₂ from the atmosphere and undo the damage that we've done, just by letting people continue to drive the same gas guzzlers they have now but changing how we make our gasoline. Of course, environmentally conscious people will unwittingly choose to damage the environment by purchasing new hydrogen cars instead of repairing the environment by continuing to drive their existing gas cars and lobbying for synthetic fuels. The auto industry will market hydrogen cars as being environmentally friendly despite the environmental damage their manufacture will cause simply because they will make more money by doing so. The oil companies don't care, either way, the shortfall in hydrogen or the shortfall in synthetic gasoline will be made up with fossil fuels in the short term and they own all the gasification equipment and fischer tropsch reactors in the refineries anyways as well as all the clean energy patents that they've been buying up.

Note that the founder of Syntroleum started by building a Fischer Tropsch reactor in his backyard to synthesize diesel from hydrogen and carbon monoxide gases and FEMA distributes gasifier plans to build a gasifier from garbage cans that can produce hydrogen and carbon monoxide gases from just about anything that burns.

Note that commercial production of hydrogen is by gasification of natural gas (because it's easier to pipe in) with steam reformation where steam is injected to react with the carbon monoxide producing more hydrogen and CO₂. You could probably do the same with a homebuilt wood gasifier, just spray in steam and bubble the output through some water so that the CO₂ forms carbonic acid with the water leaving you with hydrogen gas.

Source(s):

<http://www.sandia.gov/news/resources/rel...>

<http://www.worldchanging.com/archives/00...>

<http://www.biomassmagazine.com/article.j...>

<http://onestraw.wordpress.com/fema-gasif...>

<http://www.diversified-energy.com/index...>

4 days ago (2009-09-30 07:25:30)

95% of all hydrogen produced in the world is from steam reforming of methane. The remaining is made as a byproduct in the production of Cl₂ during the electrolysis of saltwater (NaCl).

Steam reformers have been made small enough to fit in a Laboratory or can take up a city block (10 acres).

here are some links to get you going. Google steam reformer.

 **Nata T**

You could build a electrolysis unit at home, but steam reforming require exotic catalysts. building large units require permits

to built.

Source(s):

http://en.wikipedia.org/wiki/Methane_ref...

www.hydrogenassociation.org/general/fa...

3 days ago (2009-09-30 13:42:30)

There are basically 3 safe ways to make & use hydrogen... chemically, electrically & molecularly, the first 2 being easier so I'll only discuss them here. The following steps were taking directly out of the DIY guide I offer to those who would like to run their vehicles or home on 100% water safely. The entire guide is available at www.agua-luna.com

On demand h2 generators are a bit different from the Hollywood versions like seen Chain Reaction with Keanu Reeves, that tend to explode violently every time a film is being made. However when used in an on-demand system there is no storage of hydrogen & oxygen in its gas form, only liquid (water) & is only transformed into gas "on-demand" in small cylinder sized amounts. It's actually safer than gasoline as it doesn't evaporate, creating explosive fumes in the tank & isn't explosive in its liquid form (water) like gas.

Chemically

1. You'll need a 6inch x 1ft schedule 40 pvc pipe. With pvc cement glue a cap on the bottom & use a screw on cap for the top. Drill a small hole (1/4inch or so) in the side close to the top, screwing in a small copper shut off valve. Place a few feet of stranded (food grade is good) flex hose to the valve & into the air intake of your engine (carburetor or fuel injections).
2. Now crunch up a couple aluminum cans (beer cans, soda cans etc) & drop them into the pvc pipe, along with a couple cups of lye (Red Devil drain opener has lye in it, some Clorox & Drano's do to).
3. Then simply add water, screw on the top & wait a few minutes.

What happens in simplicity is that aluminum & lye don't really get along so they battle, & as always the innocent civilians (water H2O) that the most casualties, by giving up its hydrogen & oxygen. This then builds up in the void of the pipe & is ready to be vented into your engine, by opening the valve. You may need to start your engine on gas then switch it off after the hydrogen starts burning.

Electrical is a bit easier than Chemically.

1. Simply take a small solar panel 1.5 amps is what I use (\$9 at harborfreight.com), connect the 2 wires from the panel +- to 2 conductors (carbon cores of batteries work well, just be careful removing it from the jacket), but any conductive material will work ie. Copper, aluminum, steel, etc.
 2. Drop the wires into a water tank (I use 55gal drums), make sure they don't touch each other.
 3. Drill a small hole (1/4inch or so) in the side close to the top, screwing in a small copper shut off valve. Place a few feet of stranded (food grade is good) flex hose to the valve & into the air intake of your engine (carburetor or fuel injections).
 4. Then simply add water, screw on the top cap & wait.
- After a few hours tiny bubbles will form & rise off one conductor (that's hydrogen) & even smaller bubbles that just looks like foam will rise off the other (oxygen). I don't remember which likes the positive & which likes the neg hydrogen or the oxygen.

The third method is more complicated & is what I use for my vehicles. It's just a modified Joe's Cell, there's a step by step DIY guide available to walk you through the process here www.agua-luna.com

It also covers the other 2 methods described in more detail.

Hope this helped, feel free to contact me personally if you have any questions if you'd like assistance in making your first self sufficient steps, I'm willing to walk you step by step through the process. I've written several how-to DIY guides available at www.agua-luna.com on the subject. I also offer online & on-site workshops, seminars & internships to help others help the environment.



www.AGUA-LUNA.com (Consultant)

Dan Martin

2 days ago (2009-10-01 15:48:02)

by Electrolysis of water

1 day ago (2009-10-02 09:57:59)



NARAYANA R

This question about "[How is hydrogen fuel...](#)" was originally asked on [Yahoo! Answers India](#)