



Hydrogen car



What is it for?

- This Hydrogen car has been designed to demonstrate in a simple and experimental way how a model of hydrogen car works. The electro-chemical process, which gives Hydrogen, is called reversed electrolysis. The model moves thanks to a particular fuel-cell based on the transformation of the chemical energy of hydrogen into electric power.



Operation

- The car uses a proton exchange membrane that can promote both the electrolysis reaction and the reverse process.
- A small solar panel will fuel the electrolysis process, allowing see the splitting of the two gases, oxygen and hydrogen, that subsequently will accumulate in two small transparent tanks.
- Once a certain amount of fuel has accumulated, connecting the fuel cell to the electric engine, the reverse reaction can be started: production of electricity is obtained, that moves the car and intermittently turns on a blue LED.



FROM A CHEMICAL POINT OF VIEW...

- The peculiarity of this cell lies in the fact that it can work alternately in 2 ways, electrolysis (divides distilled water into hydrogen and oxygen) and reverse electrolysis (recombines hydrogen with oxygen and regains electricity)
- The reactions that occur inside the reversible fuel cell are oxide reductions
- Electrolysis mode (electrolyser)
- Anodic reaction (oxidation): $\text{H}_2\text{O} \rightarrow 1/2 \text{O}_2 + 2 \text{H}^+ + 2 \text{e}^-$ Cathodic reaction (reduction): $2 \text{H}^+ + 2 \text{e}^- \rightarrow \text{H}_2$
- nverse electrolysis mode (fuel cell)
- Anodic reaction: $\text{H}_2 \rightarrow 2 \text{H}^+ + \text{e}^-$
- Cathodic reaction: $1/2 \text{O}_2 + 2 \text{H}^+ + 2 \text{e}^- \rightarrow \text{H}_2\text{O}$

