CAIE IGCSE Chemistry

4.2 Hydrogen–oxygen fuel cells

Notes

State that a hydrogen–oxygen fuel cell uses hydrogen and oxygen to produce electricity with water as the only chemical product

- Fuel cells are an alternative to chemical cells to produce electricity
- Hydrogen-oxygen fuel cells only use hydrogen and oxygen to produce a voltage (electricity) with water as its only chemical product
- The overall chemical reaction that happens is:
  Hydrogen + Oxygen -> Water
  $2H_2(g) + O_2(g) \rightarrow 2H_2O(l)$

(Extended only) Describe the advantages and disadvantages of using hydrogen–oxygen fuel cells in comparison with gasoline /petrol engines in vehicles

Advantages and disadvantages of using hydrogen-oxygen fuel cells in vehicles

Advantages	Disadvantages
Less carbon dioxide emissions since water is the only product	Producing the fuel cell is very expensive due to transport of hydrogen
Reduces fossil fuels being used	Less durable than gasoline/petrol engines as they are not long-lasting
Hydrogen is in abundance and can be obtained through renewable energy	Storage of hydrogen is difficult and can be dangerous
-	Producing hydrogen can still release carbon dioxide emissions