

# Grade Nine Guides

## GCSE CHEMISTRY

### Paper 1

### Energy Changes

### EXAM QUESTIONS

- Exam questions per topic

Aiming at grade 8/9



# Answers in No Waffle GCSE videos :)

## Energy changes

> How does the reaction profile show that the reaction is exothermic

[1]

> Why do alkaline batteries eventually stop working?

[1 mark]

> Why can alkaline batteries not be recharged?

[1 mark]

> Complete the balanced equation for the overall reaction in a hydrogen fuel cell.

[2 marks]

> A newspaper article referred to the converted trains as the new 'steam trains'. Suggest why

[2]

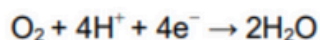
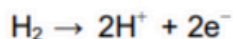
> Give two advantages of using hydrogen fuel cells instead of using rechargeable cells to power cars

[2 marks]

> Evaluate the use of hydrogen fuel cells compared with rechargeable lithium-ion batteries to power electric cars

[6 marks]

ALWAYS ASK FOR THESE EQUATIONS:



### reasons why fuel cells could be judged as better

from the table	from other knowledge
<ul style="list-style-type: none"> <li>time for refuelling a fuel cell is faster than recharging</li> <li>or</li> <li>a fuel cell does not need to be recharged</li> <li>a fuel cell has a greater range</li> </ul>	<ul style="list-style-type: none"> <li>hydrogen can be renewable if made by electrolysis using renewable energy</li> <li>lithium-ion batteries can catch fire</li> <li>produces only water</li> <li>or</li> <li>no pollutants produced</li> <li>lithium-ion batteries may release toxic chemicals on disposal</li> <li>lithium-ion batteries (eventually cannot be recharged so) have a finite life</li> </ul>

### reasons why the lithium-ion battery could be judged as better

from the table	from other knowledge
<ul style="list-style-type: none"> <li>lithium-ion uses energy more efficiently</li> <li>cost of lithium-ion car much less</li> <li>cost of recharging much less than refuelling with hydrogen</li> </ul>	<ul style="list-style-type: none"> <li>hydrogen is often made from fossil fuels so is not renewable</li> <li>charging points are more widely available than hydrogen filling stations</li> <li>hydrogen takes up a lot of space</li> <li>or</li> <li>is difficult to store</li> <li>hydrogen can be highly flammable / explosive</li> <li>no emissions produced</li> <li>(catalyst in the hydrogen fuel-cell eventually becomes poisoned so) have a finite life</li> </ul>

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