



## E10 petrol and climate change

### **Education in Chemistry**

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**A new mixture of petrol is now available at pumps in the UK. It contains an increased proportion of ethanol from renewable sources and is claimed to help lower the carbon emissions contributing to climate change.**

This activity will give you a chance to consider the underlying chemistry and assess the claims made about E10 petrol.

Read each extract (source <https://www.bbc.co.uk/news/business-57585105>) and answer the questions that follow.

### **Extract 1**

**A more eco-friendly petrol is being introduced to filling stations.**

The government intends to make E10 the new standard petrol grade.

The change is being made to cut carbon dioxide emissions the Department for Transport (DfT) says – but not all cars will be able to run on it.

#### **What is E10 petrol?**

It's a motor fuel that contains less carbon and more ethanol than fuels currently on sale.

Ethanol is a kind of alcohol manufactured from plants, including sugar beet and wheat.

It is possible to run cars on pure ethanol, **as has been done in Brazil for many years.**

But in the UK and other European countries, it is normally blended with fuel derived from oil.

Current petrol grades in the UK – known as E5 – contain up to 5% ethanol, with the other 95% being regular unleaded petrol.

Their replacement, E10, will see this percentage increased to 10% – a proportion that would bring the UK in line with countries such as Belgium, Finland, France, and Germany.

### **Questions (ethanol revision)**

1. What is the chemical formula for ethanol?
2. What part of the structure means ethanol is an alcohol?
3. Name the process for obtaining ethanol from plants?
4. What conditions are needed for the process named in Q3?

### **Use the extract to answer these questions**

5. Why is the new fuel called 'E10 petrol'?
6. Why is E10 classed as a 'more eco-friendly' fuel?

## Extract 2

### How green is this really?

That's a matter of some debate.

*Ethanol is seen as a carbon-neutral fuel, since the plants absorb carbon dioxide from the air while they are growing, offsetting the CO<sub>2</sub> emitted when the fuel is burnt.*

However, no-one is quite sure whether the two really cancel each other out.

And some people have moral objections to using food crops to produce fuels. They say it could cause food shortages or increases in food prices.

Still, if ethanol is genuinely good for the planet, then perhaps there ought to be even more of it in petrol, some environmental campaigners say.

After all, Brazil, which pioneered its use in the 1970s, has so-called 'flex-fuel' vehicles on its roads that run on any mixture of petroleum and ethanol, right up to the all-ethanol E100.

### Now answer these questions

7. What does carbon-neutral mean?
8. Why might the second sentence (in italics) be misleading?
9. State and explain one advantage and one disadvantage of using ethanol as a fuel.

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