



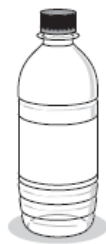
Oxford Cambridge and RSA

GCSE Chemistry B (Twenty First Century Science)

J258/04 Depth in chemistry (Higher Tier)

Question Set 10

1. Soft drinks are sold in containers made from PET (a plastic), aluminium and glass.



PET bottle



Aluminium can



Glass bottle

All three containers are non-biodegradable.

Table 10.1 and Fig. 10.1 show information about the life cycle assessment of containers from two different companies.

Company 1

| | Total life cycle energy and waste per 1000 litres of drink | | | |
|---------------|--|--|----------------|--------------------------|
| | Energy use (GJ) | Emissions | Waste produced | |
| | | CO ₂ equivalent emission (kg) | Mass (kg) | Volume (m ³) |
| PET bottle | 4.1 | 180 | 48 | 0.2 |
| Aluminium can | 5.9 | 440 | 120 | 0.3 |
| Glass bottle | 9.8 | 770 | 730 | 0.6 |

Table 10.1

Company 2

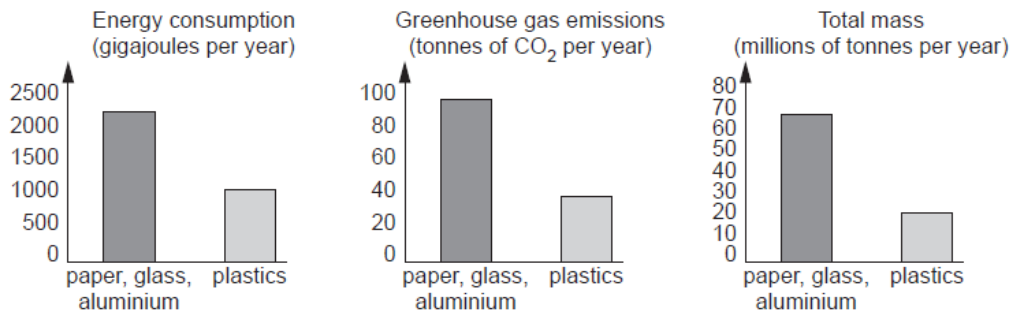


Fig. 10.1

(a) Both companies show that the same material is likely to cause the least harm to the environment when used for making containers.

Use the information in Table 10.1 and Fig. 10.1 to state and explain which material is best to use for containers and identify any differences in the information from the two companies.

(b) The way that plastic bottles are collected for recycling has changed over time.

In the past, people had to sort their waste plastic bottles and take them to bins in towns or supermarket car parks.

Now, over 90% of local authorities collected waste plastic bottles directly from homes.

Suggest how this change affects the life cycle assessment of plastic bottles. **[1]**

(c) **Company 1** and **Company 2** both manufacture drinks containers from polymers. Some people want to ban the use of all non-biodegradable packaging, including polymers.

Explain why these people have different views to the polymer companies about the use of non-biodegradable materials **[1]**

Total Marks for Question Set 10: 8

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