6 The structural formulae of two compounds, **A** and **B**, are shown.

A	B
$CH_2=CHCH_3$	$CH_3CH=CHCH_3$

A and **B** are members of the same homologous series.

(a) Give **two** reasons why the structural formulae of **A** and **B** show they are members of the same homologous series.

1 .....

2 .....
[2]

(b) Explain why **A** and **B** are both hydrocarbons.

..... [1]

(c) Write the symbol equation for the complete combustion of **A**.

..... [2]

(d) Deduce the empirical formula of **A**.

..... [1]

(e) Name compound **B**.

..... [1]

(f) A structural isomer of **B** is a member of the same homologous series.

Draw the displayed formula of this structural isomer of **B**.

[1]

(g) Compound **B** reacts with aqueous bromine at room temperature to form product **C**.
The equation is shown.

$$\underset{\textbf{B}}{CH_3CH=CHCH_3} + Br_2 \rightarrow \underset{\textbf{C}}{CH_3CHBrCHBrCH_3}$$

(i) State why this is an addition reaction.

..... [1]

(ii) Describe the colour change in aqueous bromine during this reaction.

from ..... to ..... [1]

(iii) Name product **C**.

..... [1]

(h) Under certain conditions, **one** mole of **B** reacts with oxygen to form **two** moles of carboxylic acid **D**.

Carboxylic acid **D** has **two** carbon atoms.

(i) Draw the displayed formula of carboxylic acid **D**.

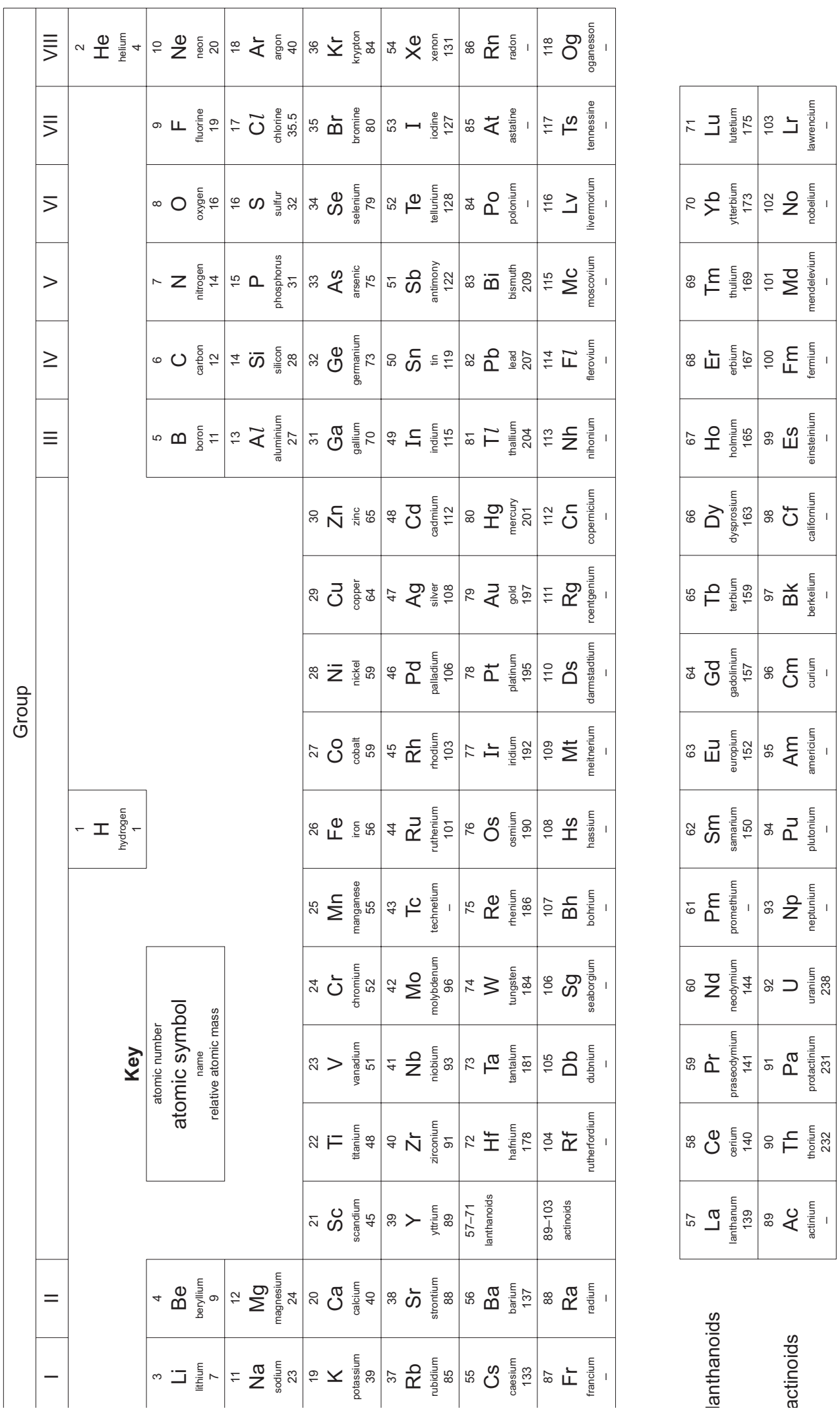
[1]

(ii) Name carboxylic acid **D**.

..... [1]

(iii) Complete the symbol equation for this reaction.

$$CH_3CH=CHCH_3 + \text{.....} \rightarrow \text{.....}$$

[1]

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