



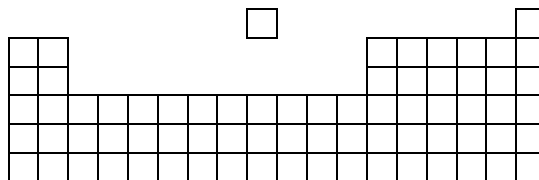
GROUP 0 – NOBLE GASES

INTRODUCTION & DATA

1) Shade in Group 0 on the Periodic Table shown.

2) Give the name for Group 0.

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3) Complete the table about the Group 0 elements.

name	symbol	atomic number	relative atomic mass	Number of electrons in outer shell	boiling point (°C)	state at room temperature	colour of vapour	atomic radius (pm)	density (g/dm ³)	% in air
helium		2	4		-269			31	0.18	0.00520%
neon		10	20		-246			38	0.90	0.01820%
argon		18	40		-190			71	1.78	0.93400%
krypton		36	85		-157			88	3.71	0.00110%
xenon		54	131		-111			108	5.85	0.00009%
radon		86	222		-62				9.97	varies

CHEMICAL PROPERTIES OF THE ELEMENTS

4) a) What is special about the electron structure of the noble gases?

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b) **Describe** and **explain** the chemical reactivity of the noble gases.

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5) a) Some food packets (e.g. crisps) contain argon gas. Explain why a noble gas is used **and** why it is argon.

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b) Welding is done in atmosphere of argon. Explain why.

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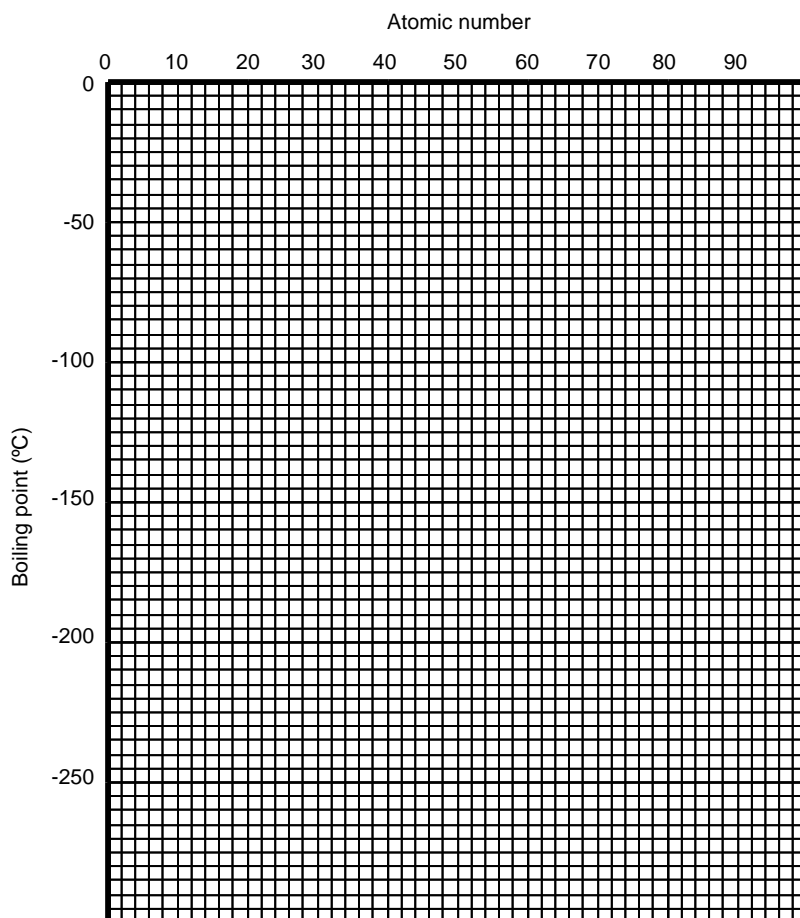
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PHYSICAL PROPERTIES OF THE ELEMENTS

6) a) Plot a best-fit graph of the boiling point of the noble gases against atomic number.



b) What is the trend in boiling points down the group?

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7) The noble gases are all gases at room temperature. There are 1000 cm³ in 1 dm³ and 1000 g in 1 kg.

a) Air has a density of 1.22 g/dm³. Which noble gases are denser than air?

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b) Helium gas has a density of 0.00018 g/cm³. What volume of helium, in cm³, has a mass of 10 kg? Give your answer to 3 significant figures.

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c) Radon gas has a density of 0.00997 g/cm³. What volume of radon, in cm³, has a mass of 10 kg? Give your answer to 3 significant figures.

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8) a) Give the atomic radius of helium in m and in nm. m nm

b) On a piece of graph paper, plot a graph of the atomic radius of the noble gases against atomic number. Draw your graph so that you can predict the atomic radius of radon.

c) What is the atomic radius of radon?