

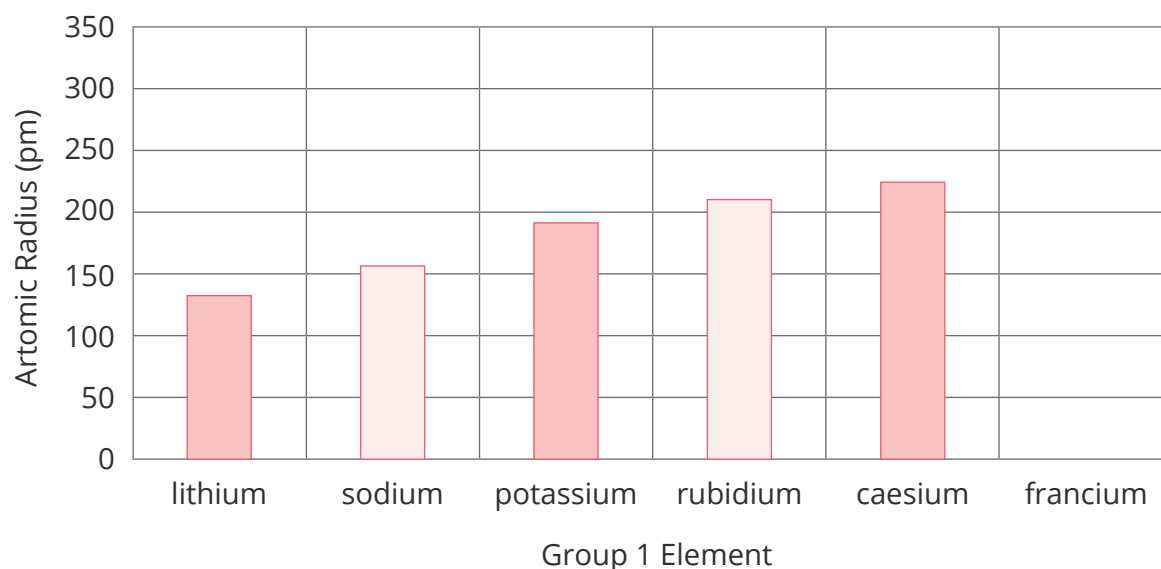


Trends in Group 1 Elements

The alkali metals are found in Group 1 of the periodic table.

1	2											3	4	5	6	7	0
							H										He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Nh	Fl	Mc	Lv	Ts	Og

The graph shows the radius of an atom of each alkali metal. The bar for francium is missing.



1. Describe the trend in the size of the atoms of the alkali metals.

2. Draw a bar on the graph to predict the radius of a francium atom.



The table shows the melting and boiling points for the alkali metals.

Element	Melting Point (°C)	Boiling Point (°C)
lithium	180	1342
sodium	98	883
potassium	64	759
rubidium	39	
caesium	29	671
francium	27	677

3. Explain why the alkali metals are solids at room temperature.

4. Predict the boiling point of rubidium.

_____ °C

The table shows what happens when some alkali metals are added to water.

Element	Observations
lithium	It floats on the water and fizzes, gradually becomes smaller until it disappears.
sodium	It fizzes rapidly and melts to form a ball that moves about on the surface of the water. The ball gets smaller quickly and disappears.
potassium	It melts and moves quickly around the surface of the water and gives off sparks and a violet flame. It disappears rapidly, sometimes with a small explosion.

5. Predict how rubidium would behave if added to water.

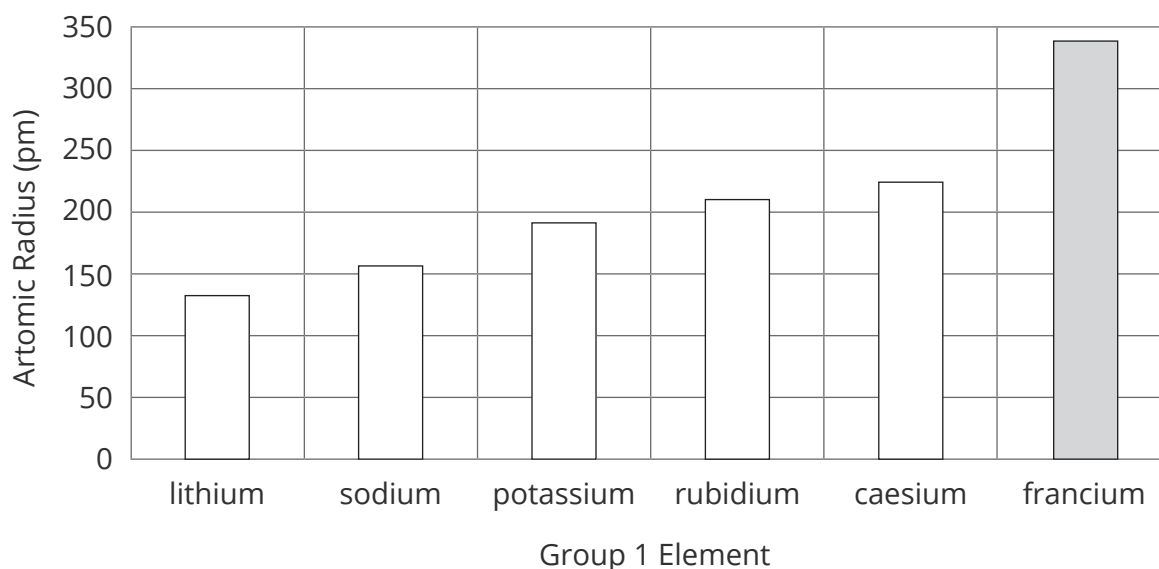


Trends in Group 1 Elements **Answers**

The alkali metals are found in Group 1 of the periodic table.

1	2											3	4	5	6	7	0
							H										He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Nh	Fl	Mc	Lv	Ts	Og

The graph shows the radius of an atom of each alkali metal. The bar for francium is missing.



- Describe the trend in the size of the atoms of the alkali metals.
As you go down the group, the radius of the atoms increases.
- Draw a bar on the graph to predict the radius of a francium atom.
Allow any bar drawn on graph that is taller than the bar for caesium.



The table shows the melting and boiling points for the alkali metals.

Element	Melting Point (°C)	Boiling Point (°C)
lithium	180	1342
sodium	98	883
potassium	64	759
rubidium	39	
caesium	29	671
francium	27	677

3. Explain why the alkali metals are solids at room temperature.

The melting points of all the alkali metals are higher than room temperature.

4. Predict the boiling point of rubidium.

670 – 758 °C

Allow any temperature between these values.

The table shows what happens when some alkali metals are added to water.

Element	Observations
lithium	It floats on the water and fizzes, gradually becomes smaller until it disappears.
sodium	It fizzes rapidly and melts to form a ball that moves about on the surface of the water. The ball gets smaller quickly and disappears.
potassium	It melts and moves quickly around the surface of the water and gives off sparks and a violet flame. It disappears rapidly, sometimes with a small explosion.

5. Predict how rubidium would behave if added to water.

- **melt quickly**
- **burn violently**
- **disappear rapidly with an explosion**