

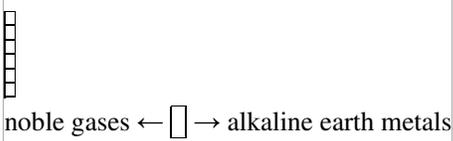
Alkali metal

From Wikipedia, the free encyclopedia

The **alkali metals** are a group in the periodic table consisting of the chemical elements lithium (Li), sodium (Na),^[note 1] potassium (K),^[note 2] rubidium (Rb), caesium (Cs),^[note 3] and francium (Fr).^[4] This group lies in the s-block of the periodic table^[5] as all alkali metals have their outermost electron in an s-orbital.^{[6][7][8]} The alkali metals provide the best example of group trends in properties in the periodic table,^[6] with elements exhibiting well-characterized homologous behaviour.^[6]

The alkali metals have very similar properties: they are all shiny, soft, highly reactive metals at standard temperature and pressure^[6] and readily lose their outermost electron to form cations with charge +1.^{[9]:28} They can all be cut easily with a knife due to their softness, exposing a shiny surface that tarnishes rapidly in air due to oxidation.^[6] Because of their high reactivity, they must be stored under oil to prevent reaction with air,^[10] and are found naturally only in salts and never as the free element.^[10] In the modern IUPAC nomenclature, the alkali metals comprise the **group 1 elements**,^[note 4] excluding hydrogen (H), which is nominally a group 1 element^{[4][12]} but not normally considered to be an alkali metal^{[13][14]} as it rarely exhibits behaviour comparable to that of the alkali metals.^[15] All the alkali metals react with water, with the heavier alkali metals reacting more vigorously than the lighter ones.^{[6][16]}

All the discovered alkali metals occur in nature: in order of abundance, sodium is the most abundant, followed by potassium, lithium, rubidium, caesium, and finally francium, which is very rare due to its extremely high radioactivity and thus occurs only in traces due to its presence in natural decay chains.^{[17][18]} Experiments have been conducted to attempt the synthesis of ununennium (Uue), which is likely to be the next member of the group, but they have all met with failure.^[19] However, ununennium may not be an alkali metal due to relativistic effects, which are predicted to have a large influence on the chemical properties of superheavy elements;^[20] even if it does turn out to be an alkali metal, it is predicted to have some differences in

Alkali metals	
	
IUPAC group number	1
Name by element	lithium group
Trivial name	alkali metals
CAS group number (US)	IA
old IUPAC number (European)	IA
↓ Period	
2	 Lithium (Li) 3
3	 Sodium (Na) 11
4	 Potassium (K) 19

physical and chemical properties from its lighter homologues.
[21]:1729–1733

Most alkali metals have many different applications. Two of the most well-known applications of the pure elements are rubidium and caesium atomic clocks,^[22] of which caesium atomic clocks are the most accurate and precise representation of time.^{[23][24]} A common application of the compounds of sodium is the sodium-vapour lamp, which emits very efficient light.^{[25][26]} Table salt, or sodium chloride, has been used since antiquity. Sodium and potassium are also essential elements, having major biological roles as electrolytes,^{[27][28]} and although the other alkali metals are not essential, they also have various effects on the body, both beneficial and harmful.^{[29][30][31][32]}

Contents

- 1 Characteristics
 - 1.1 Chemical
 - 1.1.1 Compounds and reactions
 - 1.1.1.1 Reaction with water (alkali metal hydroxides)
 - 1.1.1.2 Reaction with the group 14 elements
 - 1.1.1.3 Reaction with the pnictogens (alkali metal pnictides)
 - 1.1.1.4 Reaction with the chalcogens (alkali metal chalcogenides)
 - 1.1.1.5 Reaction with hydrogen and the halogens (alkali metal hydrides and halides)
 - 1.1.1.6 Coordination complexes
 - 1.1.1.7 Ammonia solutions
 - 1.1.1.8 Organometallic chemistry
 - 1.2 Physical
 - 1.2.1 Periodic trends
 - 1.2.1.1 Atomic and ionic radii
 - 1.2.1.2 First ionisation energy
 - 1.2.1.3 Reactivity
 - 1.2.1.4 Electronegativity
 - 1.2.1.5 Melting and boiling points
 - 1.2.1.6 Density
 - 1.3 Nuclear
- 2 Extensions

5



Rubidium (Rb)

37

6



Caesium (Cs)

55

7

Francium (Fr)

87

Legend

primordial

element by radioactive decay

Atomic number color:

black=solid