Group 1 / IA; Alkali Group

Basics

- The akali group formally contains hydrogen (H) even so this element is not counted among the alkali metals and thus not listed below.
  - Potassium (K) and sodium (Na) are ubiquitous, while rubidium (Rb), lithium (Li) and cesium (Cs) are rarer. Francium (Fr) is radioactive and not found in nature.Alltogether the alkali metals provide for about 5 % of the elements in the crust of the earth. They are very reactive and thus are never found in the elementals state

  - Alkali metals are very soft and have typically low melting points. They are rarely uised in the elemental stage (liquid sodium is a coolant in some nuclear reactors) but are absolutely indispensable in compounds. Just consider rock salt (NaCl) or the potassium nitride (KNO_3) in fertilizers. The lithium ion battery has a bright future, needing millions of tons of lithium for its production.

- *Table of Basic Data*

Name *(German)*	**Lithium** *Lithium*	**Sodium** *Natrium*	**Potassium** *Kalium*	**Rubidium** *Rubidium*	**Cesium** *Cäsium*	**Francium** *Francium*
Atomic number	3	11	19	37	55	87
Atomic mass [u]	6,94	22,99	39,10	85,47	132,91	223,02
Melting point [K]	453,69	370,95	336,8	312,2	301,55	300
Melting point [^oC]	180,69	97,95	63,8	39,2	28,55	27
Melting point [^oF]	357	208	147	102	83.4	81
Boiling point [K]	1590	1165	1047	961	963	950
Density [g/cm^3]	0,53	0,97	0,86	1,53	1,90	?
Ionization energy [eV]	5,39	5,14	4,34	4,18	3,89	4,0
Electro-negativitiy	1,0	1,0	0,9	0,9	0,9	0,9
Atomic radius [pm]	155	153,7	227	247,5	265,5	270
Oxidation numbers	1	1	1	1	1	1
Ionic radius [pm]	78	98	133	149	165	180
lattice typ Transformation	bcc	bcc	bcc	bcc	bcc	?

temp. [^{o}C]	? fcc -195 hcp	-237 fcc				
Lattice constant [Å] (a or c)	3,51	4,28 ?	5,33	5,62	2,67	?
Young's - Modul us [GPa]	11,5	8,93	3,53	2,35	1,47	?
Therm. expansion coefficient α [$10^{-6}K^{-1}$]	46,6	72	83	90	?	?

- In case of doubt all numbers are for room temperatures
- fcc = face centered cubic; lattice const. = a
  bcc = body centered cubic
  sc = simple cubic
  hp = simple hexagonal
  hcp = hexagonal close packed; lattice constants a and c.
  op = simple orthorhombic, monoclinic, triclinic
  tp = simple tetragonal
  dia = diamond structure
  r = trigonal or rhomboedral trigonal