

## Chapter 14: Atoms and the Periodic Table

### Densities of the Elements

The periodic table below shows the densities of nearly all the elements. As with the melting points, the densities of the elements either gradually increase or decrease as you move in any particular direction. Use colored pencils to color in each element according to its density. Shown below is a suggested color legend. Color lightly so that symbols and numbers are still visible. (Note: All gaseous elements are marked with an asterisk and should be the same color. Their densities, which are given in units of g/L, are much less than the densities non-gaseous elements, which are given in units of g/mL.)

Color	Density (g/mL)	Color	Density (g/mL)
Violet	gaseous elements	Yellow	16 — 12
Blue	5 — 0	Orange	20 — 16
Cyan	8 — 5	Red.	23 — 20
Green	12 — 8		

1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |

Densities of the Elements																	
(g/mL)																	
H *											He *						
0.09											0.18						
Li	Be											B	C	N *	O *	F *	Ne *
0.5	1.8											2.3	2.0	1.25	1.43	1.70	0.90
Na	Mg											Al	Si	P	S	Cl *	Ar *
1.0	1.7											2.7	2.3	1.8	2.1	3.21	1.78
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br *	Kr *
0.9	1.6	3.0	4.5	6.1	7.2	7.3	7.8	8.9	8.9	9.0	7.1	6.1	5.3	5.7	4.8	7.59	3.73
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe *
1.5	2.5	4.5	6.5	8.5	6.8	11.5	12.4	12.4	12.0	10.5	8.7	7.3	5.7	6.7	6.2	4.9	5.89
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn *
1.9	3.5	6.2	13.3	16.6	19.3	21.0	22.6	22.4	21.5	18.9	13.5	11.9	11.4	9.7	9.3	--	9.73
Fr	Ra	Ac	Unq	Unp	Unh	Uns	Uno	Une									
--	5.0	10.1	--	--	--	--	--	--	* density of gaseous phase in g/L								

Lanthanides:	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
	6.7	6.7	6.8	7.2	7.5	5.2	7.9	8.2	8.6	8.8	9.1	9.3	6.9	9.8

Actinides:	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
	11.7	15.4	19.0	20.1	19.8	13.7	13.5	14	--	--	--	--	--	--

1. Which elements are the most dense?

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2. How variable are the densities of the lanthanides compared to the densities of the actinides?

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3. Which atomic groups tend to go from higher to lower densities reading from top to bottom? (Identify each group by its group number).

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4. Which atomic groups tend to go from lower to higher densities reading from top to bottom?

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