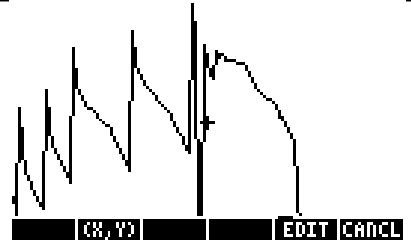
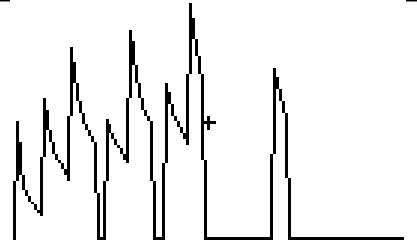
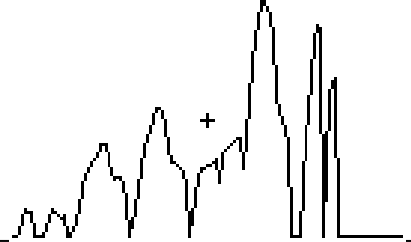
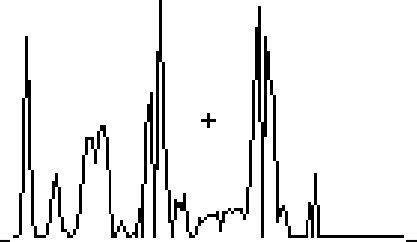
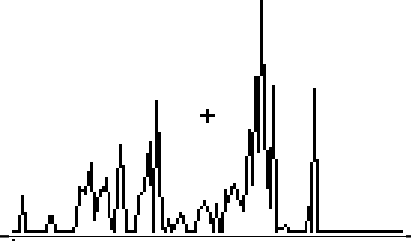
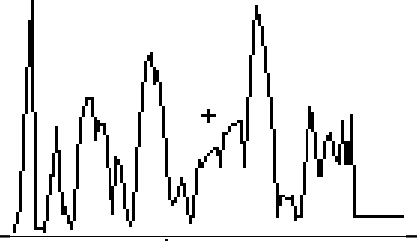

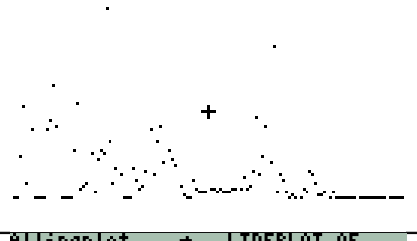


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phase, colour page 1		
2 x click = help group, period, block	GP GROUP, PERIOD, BLOCK GROUP 1-18, PERIOD 1-7, BLOCK s,p,d,f	EN ELECTR. NEG. electronegativity of Pauling, ability of atom to attract electrons
electronegativity		
magnetic susceptibility	MS MAGN. SUSC. volume magnetic susceptibility, degree of magnetisation in external field % $B=\mu \times H$, $\mu=\mu_0(1+\chi)$ B =magnetic induction, H =magnetic field, $\chi_{mass}=\chi/\rho$ mass susceptibility, $\chi_{mol}=M \times \chi_{mass}$ molar susceptibility	SM SHEAR MOD. 1-GPa shear modulus, shear stress/strain G , $G=(F/A)/(\Delta x/L)$, F =force, A =area, Δx =displacement, L =initial length
shear modulus		
covalent radius	CO COV. RADIUS 1-pm covalent radius, distance between nuclei of an equal pair of atoms	BN BRIN. HARD. 1-MPa Brinell hardness, penetration of sphere in material, F =force, D =indenter, d =indentation radius $BN=2F/(\pi D(D-\sqrt{D^2-d^2}))$
Brinell hardness		
group, period, block	2 El GRPERBL 1 H 1,1,s 2 He 18,1,s 3 Li 1,2,s 4 Be 2,2,s 5 B 13,2,p 6 C 14,2,p 7 N 15,2,p 8 O 16,2,p 9 F 17,2,p 10 Ne 18,2,p 11 Na 1,3,s 12 Mg 2,3,s	104 Rf 4,7,d 105 Db 5,7,d 106 Sg 6,7,d 107 Bh 7,7,d 108 Hs 8,7,d 109 Mt 9,7,d 110 Ds 10,7,d 111 Rg 11,7,d 112 Cn 12,7,d 113 Nh 13,7,p 114 Fl 14,7,p 115 Mc 15,7,p 116 Lv 16,7,p
next page	2 El ATWEIGHT 1 H 1.00794 2 He 4.002602 3 Li 6.941 4 Be 9.012182 5 B 10.811 6 C 12.0107 7 N 14.0067 8 O 15.9994 9 F 18.9984032 10 Ne 20.1797 11 Na 22.98977 12 Mg 24.305	104 Rf Rn 5f14 6d2 7s2 105 Db Rn 5f14 6d3 7s2 106 Sg Rn 5f14 6d4 7s2 107 Bh Rn 5f14 6d5 7s2 108 Hs Rn 5f14 6d6 7s2 109 Mt Rn 5f14 6d7 7s2 110 Ds Rn 5f14 6d8 7s2 111 Rg Rn 5f14 6d9 7s2 112 Cn Rn 5f14 6d10 7s2 113 Nh Rn 5f14 6d10 7s2 7p1 114 Fl Rn 5f14 6d10 7s2 7p2 115 Mc Rn 5f14 6d10 7s2 7p3 116 Lv Rn 5f14 6d10 7s2 7p4
atomic weight	2 El ATWEIGHT 1 H 1.00794 2 He 4.002602 3 Li 6.941 4 Be 9.012182 5 B 10.811 6 C 12.0107 7 N 14.0067 8 O 15.9994 9 F 18.9984032 10 Ne 20.1797 11 Na 22.98977 12 Mg 24.305	104 Rf Rn 5f14 6d2 7s2 105 Db Rn 5f14 6d3 7s2 106 Sg Rn 5f14 6d4 7s2 107 Bh Rn 5f14 6d5 7s2 108 Hs Rn 5f14 6d6 7s2 109 Mt Rn 5f14 6d7 7s2 110 Ds Rn 5f14 6d8 7s2 111 Rg Rn 5f14 6d9 7s2 112 Cn Rn 5f14 6d10 7s2 113 Nh Rn 5f14 6d10 7s2 7p1 114 Fl Rn 5f14 6d10 7s2 7p2 115 Mc Rn 5f14 6d10 7s2 7p3 116 Lv Rn 5f14 6d10 7s2 7p4
electron configuration	2 El ATWEIGHT 1 H 1.00794 2 He 4.002602 3 Li 6.941 4 Be 9.012182 5 B 10.811 6 C 12.0107 7 N 14.0067 8 O 15.9994 9 F 18.9984032 10 Ne 20.1797 11 Na 22.98977 12 Mg 24.305	104 Rf Rn 5f14 6d2 7s2 105 Db Rn 5f14 6d3 7s2 106 Sg Rn 5f14 6d4 7s2 107 Bh Rn 5f14 6d5 7s2 108 Hs Rn 5f14 6d6 7s2 109 Mt Rn 5f14 6d7 7s2 110 Ds Rn 5f14 6d8 7s2 111 Rg Rn 5f14 6d9 7s2 112 Cn Rn 5f14 6d10 7s2 113 Nh Rn 5f14 6d10 7s2 7p1 114 Fl Rn 5f14 6d10 7s2 7p2 115 Mc Rn 5f14 6d10 7s2 7p3 116 Lv Rn 5f14 6d10 7s2 7p4

electron shells	65 Tb 8,18,27,8 66 Dy 8,18,28,8 67 Ho 8,18,29,8 68 Er 8,18,30,8 69 Tm 8,18,31,8 70 Yb 8,18,32,8 71 Lu 8,18,32,9 72 Hf 8,18,32,10 73 Ta 8,18,32,11 74 W 8,18,32,12 75 Re 8,18,32,13 76 Os 8,18,32,14 77 Ir 8,18,32,15	26 Fe 54,56-58 27 Co 59 28 Ni 58,60-62,64 29 Cu 63,65 30 Zn 64,66-68,70 31 Ga 69,71 32 Ge 70,72-74 33 As 75 34 Se 74,76-78,80 35 Br 79,81 36 Kr 78,80,82-84,86 37 Rb 85 38 Sr 84,86-88
stable isotopes		
oxidation states	53 I +4,6,-2 54 Xe +1,5,7,-1 55 Cs 0 56 Ba +2 57 La +3 58 Ce +3,4 59 Pr +3,4 60 Nd +3 61 Pm +3 62 Sm +2,3 63 Eu +2,3 64 Gd +3	13 Al 3 14 Si 4 15 P 3,5 16 S 2,4,6 17 Cl 3,4,5,7 18 Ar - 19 K 1,2 20 Ca 2 21 Sc 3 22 Ti 2,3,4 23 V 2,3,4,5 24 Cr 2,3,4,6 25 Mn 2,3,4,6,7
ionic radii (pm)		
electronegativity (Pauling)	13 Al 1.61 14 Si 1.9 15 P 2.19 16 S 2.58 17 Cl 3.16 18 Ar - 19 K 0.82 20 Ca 1 21 Sc 1.36 22 Ti 1.54 23 V 1.63 24 Cr 1.66 25 Mn 1.55	2 Fe 1.83 3 Li 0.98 4 Be 1.57 5 B 2.04 6 C 2.55 7 N 3.04 8 O 3.44 9 F 3.98 10 Ne - 11 Na 0.93 12 Mg 1.31 13 Al 1.61 14 Si 1.9 15 P 2.19 16 S 2.58 17 Cl 3.16 18 Ar - 19 K 0.82 20 Ca 1 21 Sc 1.36 22 Ti 1.54 23 V 1.63 24 Cr 1.66 25 Mn 1.55
ionisation energy (KJ/mol)		
density (kg/m^3)	72 Pt 21090. 73 Au 19300. 80 Hg 13534. 81 Tl 11850. 82 Pb 11340. 83 Bi 9780. 84 Po 9196. 85 At - 86 Rn 973 87 Fr - 88 Ra 5000. 89 Ac 10070. 90 Th 11724.	2 Fe 7860. 3 Li 534. 4 Be 1825. 5 B 2344. 6 C 2267. 7 N 1000. 8 O 1429. 9 F 1690. 10 Ne 1200. 11 Na 925. 12 Mg 1738.
melting point (°C)		
Allbarplot: choose barplot of property for all elements	0: CHOOSE PLOT PROPERTY 1: CRISTAL 2: ELECTNEG 3: ELAFFIN 4: ELCOND 5: MAGNSUSC 6: IONENRGY 7: MOLARVOL 8: ATOMRAD 9: CANCEL OK	0: CHOOSE PLOT PROPERTY 1: COVARAD 2: MAALSRAD 3: IONICRAD 4: DENSITY 5: BULKMOD 6: SHEARMOD 7: YOUNGMOD 8: POLSRAT 9: CANCEL OK
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another page	0: CHOOSE PLOT PROPERTY 1: MONSHARD 2: BRINHARD 3: VICKHARD 4: MELTPOIN 5: BOILPOIN 6: HEATFUS 7: HEATVAP 8: HEATATOM 9: CANCEL OK	0: CHOOSE PLOT PROPERTY 1: MELTPOIN 2: BOILPOIN 3: HEATFUS 4: HEATVAP 5: HEATATOM 6: SPECHEAT 7: THERMCON 8: THERMENP 9: CANCEL OK
Help		
barplot of electronegativity		
velocity of sound		
electric conductivity		
first ionisation energy		

lineplot of atomic radii		
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lineplot Brinell hardness		
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