Electronegativity

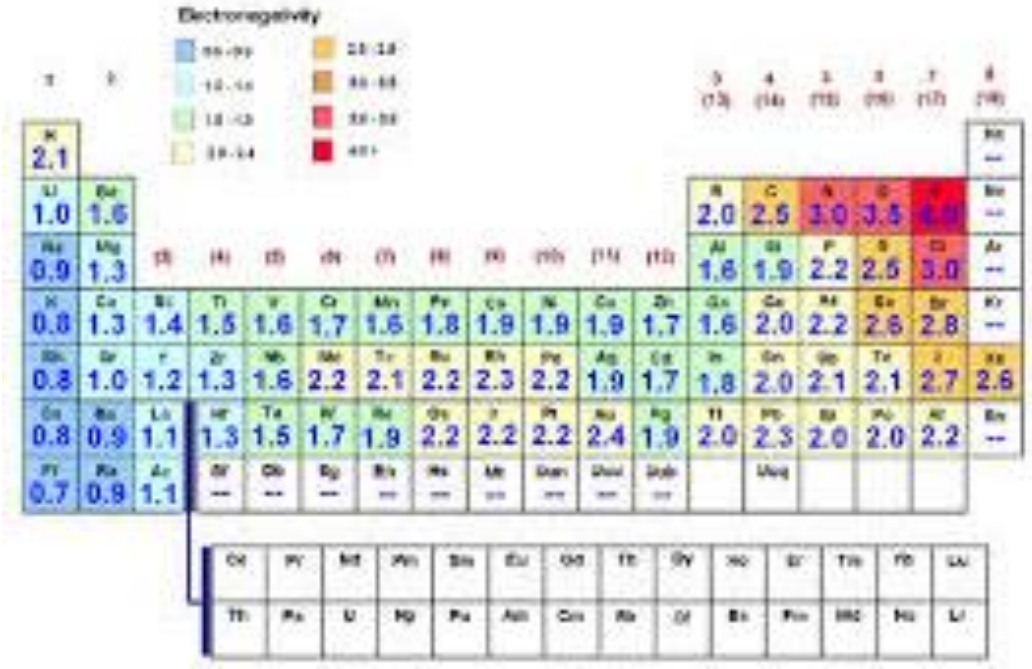
What is electronegativity?

How well an atom can attract a pair of bonding electrons to itself. It is a calculated value and can not actually be measured.

How do you think it changes across a period? Down a group?

Electronegativity:

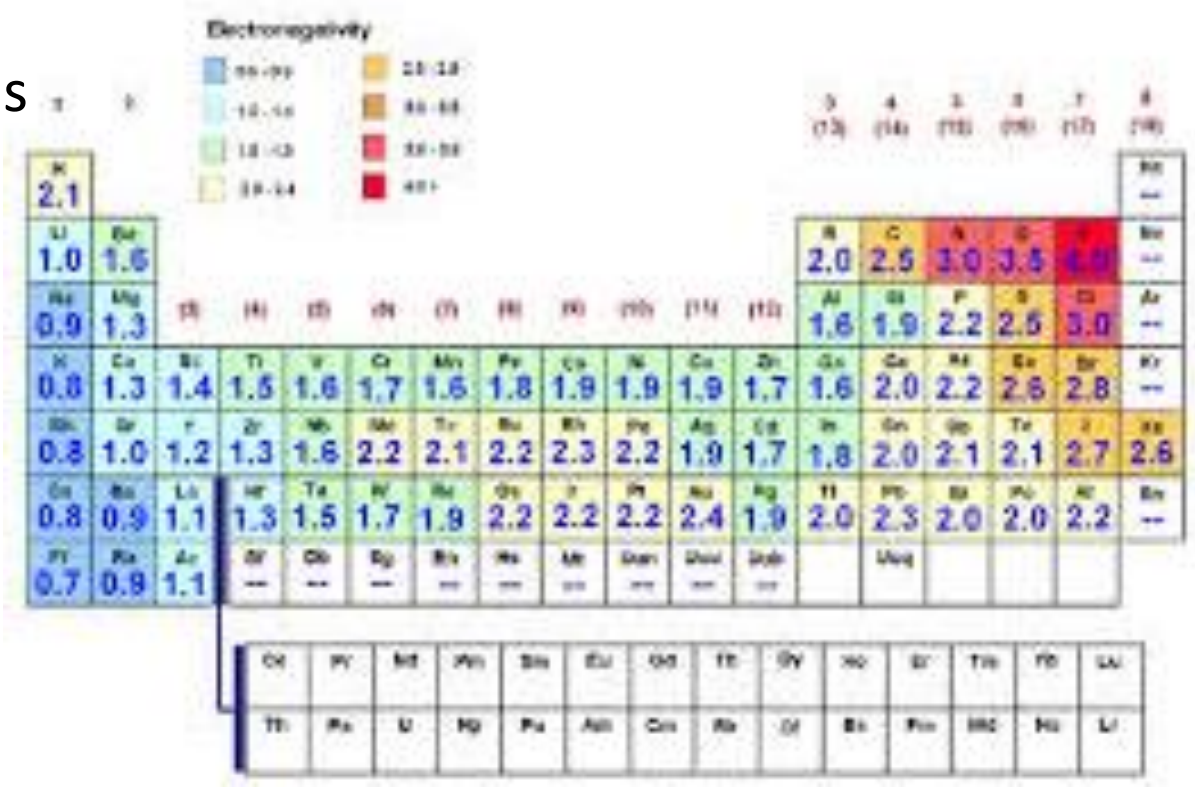
- Increases across a period
- Decreases down a group



Electronegativity

What affects electronegativity? ie what affects the ability of an atom to attract electrons to itself

- The energy level the electron is in (distance of orbital from the nucleus)
- Charge of the nucleus



Electronegativity

Why does oxygen have a higher electronegativity than carbon?

What is the definition of the term.
Where are the atoms located on the periodic table (and valence electrons).
How this affects the stated trend.
Why it affects the stated trend and relate back to question.

Electronegativity is the ability of an atom to attract a pair of bonding electrons towards itself. Both oxygen and carbon are located in the same period on the periodic table, so the bonding electron pairs would be in the same valence shell.

Oxygen has more protons in its nucleus than carbon so it has a higher effective nuclear charge, which **means that** the electrons in the valence shell of oxygen are more attracted to the nucleus than the electrons in the valence shell of carbon.

The greater attraction between the oxygen nucleus and its valence electrons **means that** oxygen has a higher electronegativity value than carbon.

2013 Exam Q1 b (i)

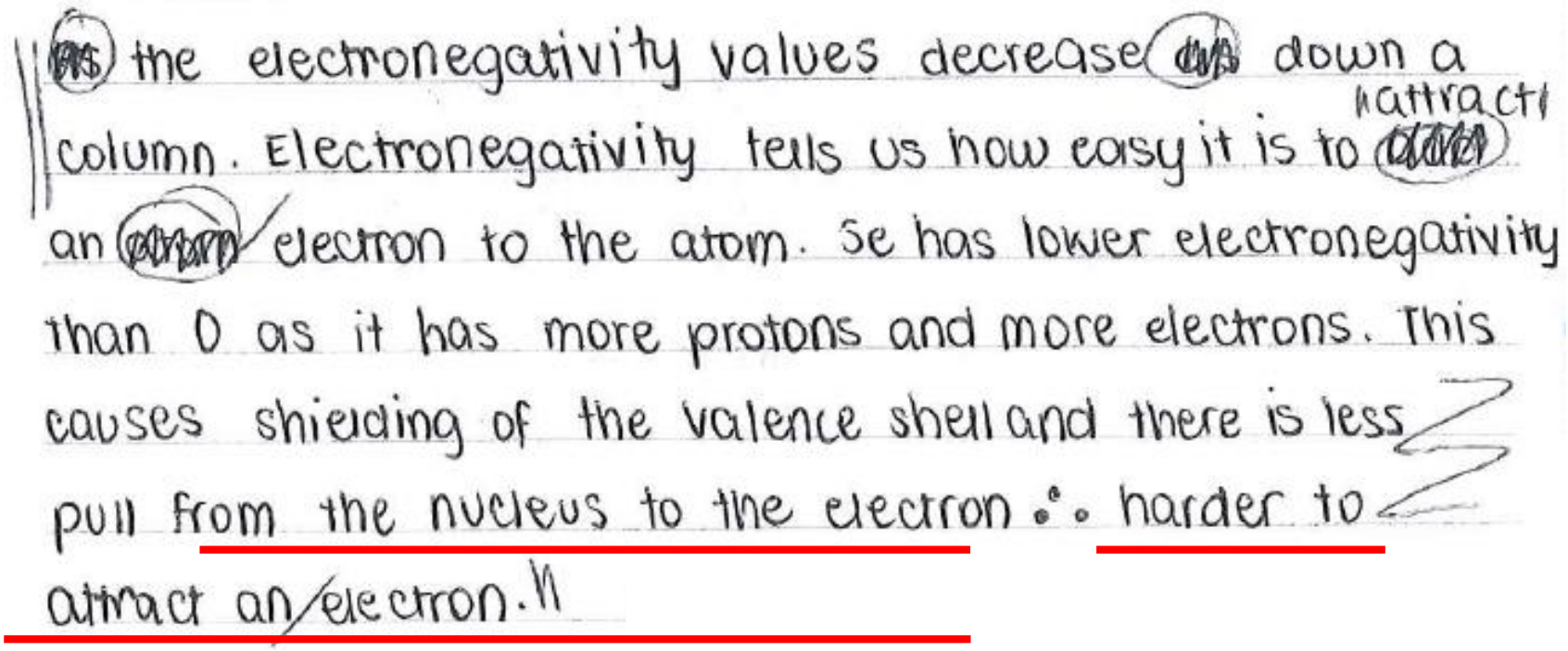
(b) Discuss the data for each of the following pairs of particles.

(i)

Atom	Electronegativity
O	3.44
Se	2.55

the electronegativity is the ~~energy required~~ atoms tendancy to attract other electrons. The data shows that oxygen has a higher electronegativety then Se, therefore a higher tendancy / ability to attract electrons. This is because Se has more electrons then Oxygen. // Answer lacks sufficient details for achievement

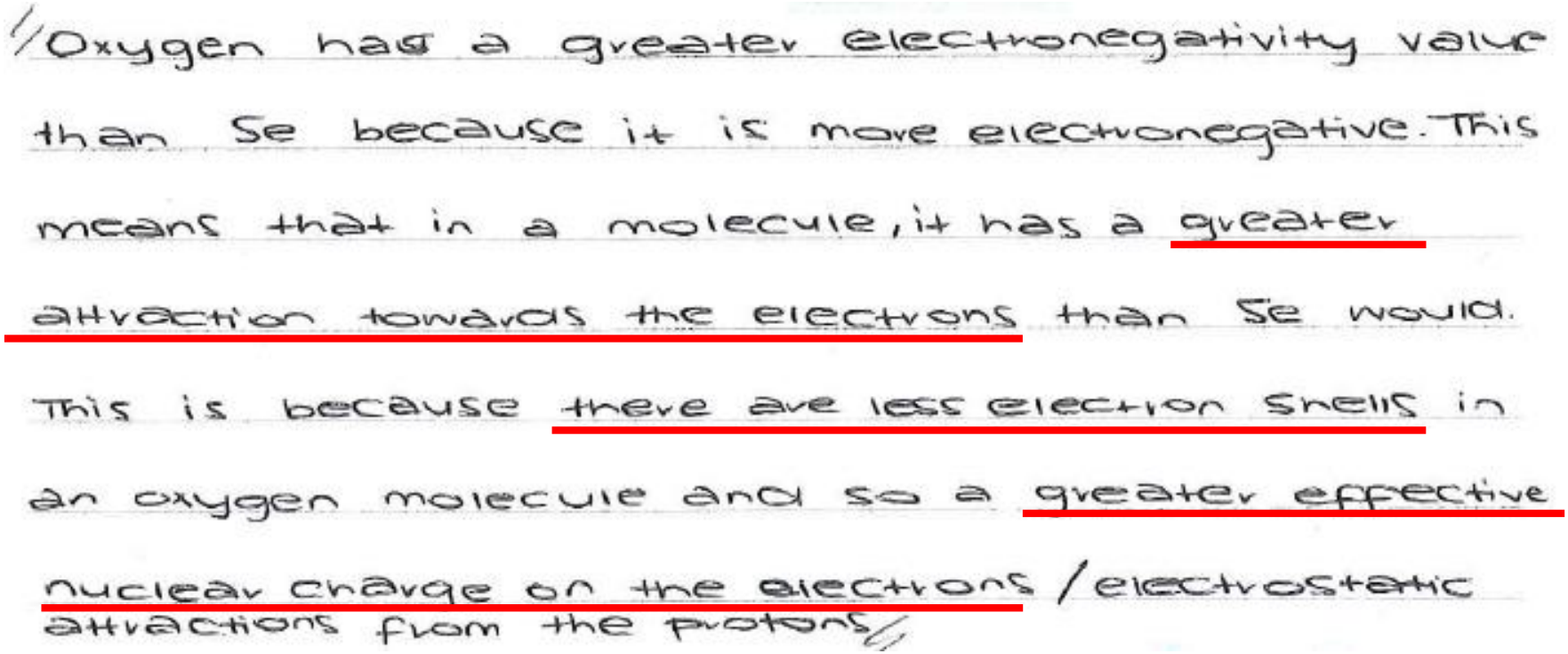
2013 Exam Q1 b (i)



Definition of electronegativity, explanation of shielding of Se electrons is OK BUT not directly related back to question

What detail could we add? Energy level of electrons for O and Se
Location of atoms on periodic table

2013 Exam Q1 b (i)



Definition of electronegativity, statement of energy levels of valence electrons for each atom, explanation of electrons attracted to the nucleus good

NOT linked back to question

Summary

Ionisation Energy

Electronegativity

Atomic Radii

"shielding" electrons in different valence shells

"effective nuclear charge"

more protons, electrons in same valence shell

1																	18
1 H 1.0079	2															17	2 He 4.0026
3 Li 6.941	4 Be 9.0122															9 F .998	10 Ne 20.180
11 Na 22.990	12 Mg 24.305	3	4	5	6	7	8	9	10	11	12					17 Cl 35.453	18 Ar 39.948
19 K 39.098	20 Ca 40.078	21 Sc 44.956	22 Ti 47.867	23 V 50.942	24 Cr 51.996	25 Mn 54.938	26 Fe 55.845	27 Co 58.933	28 Ni 58.693	29 Cu 63.546	30 Zn 65.409	31 Ga 69.723	32 Ge 72.64	33 As 74.922	34 Se 78.96	35 Br 79.904	36 Kr 83.798
37 Rb 85.468	38 Sr 87.62	39 Y 88.906	40 Zr 91.224	41 Nb 92.906	42 Mo 95.94	43 Tc (98)	44 Ru 101.07	45 Rh 102.91	46 Pd 106.42	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.71	51 Sb 121.76	52 Te 127.60	53 I 126.90	54 Xe 131.29
55 Cs 132.91	56 Ba 137.33	57-71 *	72 Hf 178.49	73 Ta 180.95	74 W 183.84	75 Re 186.21	76 Os 190.23	77 Ir 192.22	78 Pt 195.08	79 Au 196.97	80 Hg 200.59	81 Tl 204.38	82 Pb 207.2	83 Bi 208.98	84 Po (209)	85 At (210)	86 Rn (222)
87 Fr (223)	88 Ra (226)	89-103 #	104 Rf (261)	105 Db (262)	106 Sg (266)	107 Bh (264)	108 Hs (270)	109 Mt (268)	110 Ds (281)	111 Rg (272)	112 Uub (285)	113 Uut (284)	114 Uuq (289)	115 Uup (288)	116 Uuh (291)		118 Uuo (294)

* Lanthanide series	57 La 138.91	58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm (145)	62 Sm 150.36	63 Eu 151.96	64 Gd 157.25	65 Tb 158.93	66 Dy 162.50	67 Ho 164.93	68 Er 167.26	69 Tm 168.93	70 Yb 173.04	71 Lu 174.97
# Actinide series	89 Ac (227)	90 Th 232.04	91 Pa 231.04	92 U 238.03	93 Np (237)	94 Pu (244)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (251)	99 Es (252)	100 Fm (257)	101 Md (258)	102 No (259)	103 Lr (262)

Ionisation Energy

Electronegativity