

16. Stability of complete filled B^+

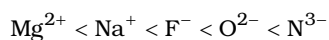
The first ionization energy of carbon is greater than the same of boron as predicted from periodic trend.

However, for $2s^2 \uparrow\downarrow$; more stable than $C^+ = 1s^2 2s^2 \uparrow$ ionization trend is reversed due to stability of completely filled 2s-orbital of B^+ :

17.(B) Elements having half filled valence subshell have high ionisation energy. Also, ionisation energy decreases down the group.

18. $Mg^{2+} < Na^{2+} < F^- < O^{2-} < N^{3-}$

Ionic size



19.(D) The d-subshells are not filled monotonically. The regular trend is broken by Cr and Cu.

20. Higher effective nuclear charge

Greater the positive charge, smaller is the radius.

21.(F) The basic nature of hydroxides increases down the group.

22.(F) Cl has maximum electron affinity. Hence the order is : $Cl > F > Br$

23.(D) Mg^{2+}	$1s^2 2s^2 2p^2$	no unpaired electron
Ti^{3+}	$1s^2 2s^2 2p^2 3s^2 3p^2 3d^1$	one unpaired electron
V^{3+}	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^2$	two unpaired electrons
Fe^{2+}	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^6$	four unpaired electrons

24. Inert pair effect

Inert pair effect favours lower oxidation state among isoelectric species.

25.(B) Mg^+ requires less energy for further ionisation as compared to Na^+ due to the noble gas configuration of Na^+ .

26.(C) Statement I is true; Statement II is false.

F atom has slightly lower affinity for the electron than chlorine. It is due to the reason that additional electrons are repelled more effectively by 2p-electrons in F than by 3p-electrons in Cl-atom.

27.(D) For ions of same elements, greater the positive charge, lesser is the radius.

28.(C) Statement-1 is true.

Be $1s^2 2s^2$: Fully filled valence subshell higher IE

B $1s^2 2s^2 2p^1$

Statement-II is false as the energy of 2s is lower than 2p.

29.(B) Ionisation energy decreases down the group.

30.(C) Statement-I is correct. Due to inert pair effect, Pb^{4+} is unstable and can be easily reduced to Pb^{2+} is stronger oxidising agent than Sn^{4+} .

Statement-II is false. The higher oxidation states for group 14 elements are less stable for heavier elements of the group due to inert pair effect.