413. [B]

As the correct order of ionization energy is Li < B < Be < C

414. [B]

Both B and D have exactly half - filled configuration, but B has smaller size than D, hence it has higher I.E.

- 415. [C]
- 416. [C]

Nitrogen, being smallest in size, can given up its lone pair of electrons most easily.

417. [A]

Lattice energy
$$\alpha \frac{1}{r^+ + r^-}$$

418. [D]

 $\rm IE_1$ of Mg is higher than that of Na because of increased nuclear charge and also that of Al because in Mg a 3 s-electron has to be removed while in Al it is the 3pelectron. The IE₁ of Si is, however, higher than those of Mg and Al because of it increased nuclear charge. Hence, the order is

Na < Mg > Al < Si

419. [A]

Si and P are in the 3rd period while C and N are in the 2nd period. Elements in 2nd period have higher electronegativities than those in the 3rd period. Since N has msaller size and hgiher nuclear charge than C, its electronegativity is higher than that of Si. Thus, the order is Si, P, C, N.

420. [C]

 $\begin{array}{l} \mathsf{Ca}+\mathsf{H}_2\mathsf{O}\to\mathsf{Ca}(\mathsf{OH})_2+\mathsf{H}_2\mathsf{O}\\ \mathsf{CaH}_2+\mathsf{H}_2\mathsf{O}\to\mathsf{Ca}(\mathsf{OH})_2+\mathsf{H}_2\\ \mathsf{hydroith} \end{array}$

421. [D]

Like dissolues like as acetone has high covalent character dissoluves relatively covalent compound.

422. [AB]

Weak metallic bond as due to poor shielding of d & f orbital its ionisation energy became high & kernel formation becomes difficult.

423. [D]

It is because of the electronic repulsion.

424. [C]

As in (III) the correct order of increasing the first ionization enthalpy is B < C < O < N.

425. [A]

As acidic nature increases left to right in a period with increases in electronegativity.

426. [B]

Electron affinity =

 $\frac{\text{Energy released x N}_{0}}{\text{Number of atom ionized}}$

$$= \frac{4.8 \times 10^{-13} \times 6.023 \times 10^{23}}{10^6}$$
$$= 28.9104 \times 10^4 \text{ J} = 289 \text{ kJ}.$$

427. [C]

Chlorine being the group 17 element has maximum electronegativity. 'N' has zero electron affinity because extra stability is associated with exactly half - filled orbitals. Sulphur has more electron affinity than 'O' because the effect of small size of O atom is more than by the repulsion of electron already present in 2p-orbitals of O atom. 428. [B]

429. [A]

430. [A]

As ionization energy decreases with the increases in number of orbits or down the group.

431. [A]

KMnO₄ acts as self indicator.

432. [D]

Since fluorine atom has a smaller size than iodine, it has greater electron attracting power and so it is a better oxidizing agent.

433. [B]

434. [D] $Cu^{2+} \rightarrow blue$ $CruO_4^{2-} \rightarrow yellow$

435. [A]

436. [A]

 $CI + e^- \rightarrow CI^- + 3.7 \text{ eV}$

35.5 3.7×23.06 kcal

As energy released for conversion of 4 g gaseous chlorine into \mbox{Cl}^- ions.

$$= \frac{3.7 \times 23.06}{35.5} \times 4 = 9.6 \text{ kcal}$$

437. [D]

 $E_1 : E_2 n = 0.475 : 1$ Using the proportinally constant k, $E_1 k + E_2 k = 2226 \text{ kJ mol.}$ While, $E_1 k / E_2 k = 0.475/1$. On solving. $E_2 k = 2226 \times 1/1.475 = 1509 \text{ kJ/mol.}$

438. [D]

Half-filled $2p^3$ subshell of O⁺ is more stable than $2p^4$ subshell of F⁺ So IE₂ of O will be greater than that of F⁺.