

Q1:

Ionization enthalpies of transition metals are:

A intermediate between those of s- and p- block elements

B more than p-block elements

C highest in all the elements

D lower than s-block elements

Correct option is A)

Q2:

Question



The transition metals have a less tendency to form ions due to

A high ionisation energy

B low heat of hydration of ion

C high heat of sublimation

D All of these

Correct option is D)

The transition metals have a less tendency to form ions due to high heat of sublimation, high ionisation energy and low heat of hydration energy.

Hence ,Option "D" is the correct answer

Q3:(1) Why do transition elements show variable oxidation states?

(2) Name the element showing the maximum number of oxidation states among the first series of transition metals from Sc(Z=21) to Zn(Z=30).

(3) Name the element which shows only +3 oxidation state.

Answer:

(1) Transition elements (also known as transition metals) are elements that have partially filled d orbitals. IUPAC defines transition elements as an element having a d subshell that is partially filled with electrons, or an element that has the ability to form stable cations with an incompletely filled d orbital. The electronic configuration of transition element is $(n-1)d^5 ns^1$ or $(n-1)d^{10} ns^1$.

These elements show variable oxidation states because their valence electrons are in two different sets of orbitals, that is $(n-1)d$ and ns . The energy difference between these orbitals is very less, so both the energy levels can be used for bond formation. Thus, transition elements have variable oxidation states.

(2) Mn(Z=25) has the highest number of unpaired electrons in the d-subshell, and it shows a high oxidation state(+7).

(3) Scandium (Sc) only exhibits a +3 oxidation state in these series.