



CHEMISTRY

BOOKS - PEARSON IIT JEE

FOUNDATION

PERIODIC CLASSIFICATION OF ELEMENTS

Example

1. Is the Dobereiner's law of triads applicable for phosphorus arsenic and antimony? Explain



Watch Video Solution

2. Considers Dobereiner's triad with elements X, Y and Z. The sum of atomic weights of extreme elements X and Z is 46 and the difference of atomic weights Z and Y is two times the atomic number of oxygen. Identify X, Y and Z.





[Watch Video Solution](#)

3. Why is the atomic number of an element more important than its atomic mass in the context of its properties ?



[Watch Video Solution](#)

4. The position of hydrogen is not justified even in modern table and it is called rogue element why?



[Watch Video Solution](#)

5. Why do the chemical properties along a period vary?



[Watch Video Solution](#)

6. How does the magnitude of effective nuclear charge influence the electron affinity of an element ?



[Watch Video Solution](#)

7. Predict the position and properties like metallic /non metallic character and oxidizing / reducing capacity of an element with atomic number 35 in the periodic table



[Watch Video Solution](#)

8. Write with electronic configuration of the most stable cation of the fourth period element which has lowest ionisation potential value justify your answer



[Watch Video Solution](#)

9. How is electropositive character related to reducing property of an element ? How does it vary in the group?



[Watch Video Solution](#)

Level 1

1. In doberienner 's classification the atomic weight and the properties of the first element

are almost equal to the average of those of the 2nd and 3rd elements of a triad



[Watch Video Solution](#)

2. Atomic number of the isotopes of an element are different



[Watch Video Solution](#)

3. Differentiating electrons enter anti penultimate shell in transition elements



[Watch Video Solution](#)

4. Along a period atomic volume of the elements gradually increases from left to right due to an increase in the number of valence electrons



[Watch Video Solution](#)

5. The element with atomic number 17 has the least size among all the elements of that

period



[Watch Video Solution](#)

6. The lower is the value of ionisation potential of an element the greater is its reducing power



[Watch Video Solution](#)

7. Among all the groups the maximum number of elements is found in IIB group



[Watch Video Solution](#)

8. In the modified mendeleev 's periodic tables _____groups and _____periods are present whereas in modern periodic table _____



[Watch Video Solution](#)

9. If the three elements X,Y and Z form a triad and atomic weights of X and Z are 9 and 40

respectively then the atomic weight of an element y is _____



[Watch Video Solution](#)

10. Mendeleev named certain undiscovered elements as eka boron and eka aluminium which when later discovered were called _____ and _____



[Watch Video Solution](#)

11. According to Newland's classification the properties of the 3rd element will find similarity with those of the _____ element



[Watch Video Solution](#)

12. Extremely electropositive metals are present in _____ and _____ groups



[Watch Video Solution](#)

13. The atomic number of an element that belongs to the IVA group and 4th period is



[Watch Video Solution](#)

14. Good reducing agents are found in _____ and _____ groups



[Watch Video Solution](#)

15. Match the entries given in column A with appropriate ones in column B

Column A	Column B
A. Calcium	() a. Modern periodic table
B. Sodium	() b. Naturally occurring radioactive element
C. Uranium	() c. II A
D. Lanthanides and actinides	() d. Alkali metal
E. 18 groups and 7 periods	() e. 8 elements
F. 2nd and 3rd period in modern periodic table	() f. III B



Watch Video Solution

16. Atomic weights of three elements in a Dobereiner's triad are x , 81 and 127. Find the missing atomic weight

A. 104

B. 35

C. 46

D. 23

Answer: b



Watch Video Solution

17. The properties which increase on going down the group are _____

A. ionisation energy and electro negativity

B. atom size and ionisation energy

C. electro negativity and atomic size

D. metallic character and reducing power

Answer: d



Watch Video Solution

18. Which of the following belong to the same group?

A^{3+} (number of electrons=10)

B^{2+} (number of electrons =10)

C (number of electrons =5)

D (number of electrons=31)

A. abc

B. bcd

C. acd

D. adb

Answer: c



Watch Video Solution

19. Which of the following is not true ?

A. all the fourth period element have the
4th shell as the valence shell

B. in all fourth period elements
differentiating electrons enter the 4th
shell

C. in fourth period element differentiating

electrons enter either the 4th shell or

the third shell

D. 1st transition series elements are

present in the fourth period

Answer: B



Watch Video Solution

20. The values of the second electron affinities of elements are positive. Which of the following could be the appropriate reason?

A. Work has to be done against the force of repulsion of the valence electron of the uninegative ion

B. Work has to be done against the force of attraction of the nucleus

C. The electron loses its energy since it has to work against the repulsive force

D. in uinegative ions the effective nuclear force of attrction towards the valence electrons becomes more

Answer: A:C, B:d , C:b , D:Fe , Df:a



View Text Solution

21. Why is the ionisation energy of suphur less than that of phosphorous though sulphur is next to phosphorous in the period ?

A. atomic radius of sulphur is greater than that of phosphorus

B. sulphur has half filled electronic configuration

C. phosphorus has half filled electronic configuration

D. in the third period the ionization energy decreases along the period

Answer: c



Watch Video Solution

22. The element which accepts electrons readily to form anion belongs to

A. VII A group and second period

B. VII A group and third period

C. O group and third period

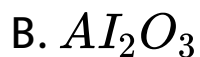
D. VI A group and third period

Answer: b



Watch Video Solution

23. Identify the oxide which forms the strongest base:



Answer: c



Watch Video Solution

24. The formula of the oxide of an element M is M_2O_3 . The first four ionisation energies of the element M can be in the order

A. 120 kcal, 2780 kcal, 400 kcal and 5098 kcal

B. 210 kcal, 150 kcal, 370 kcal and 590 kcal

C. 70 kcal, 100 kcal, 105 kcal and 120 kcal

D. 560 kcal, 410 kcal, 320 and 290 kcal

Answer: A:C, B:d, C:b, D:Fe, Df:a



Watch Video Solution

25. The chemistry of alkali metals is essentially the chemistry of unipositive ions because

A. they have low ionisation energy values

B. they have strong tendency to lose single valence electron

C. second ionisation energy values are very high

D. all the above

Answer: d



Watch Video Solution

26. Na^+ , F^- and Mg^{+2} ions have the same

A. size

B. electronic configuration

C. ionisation energy

D. nuclear charge

Answer: b



Watch Video Solution

27. Gallium is more electronegative than the elements below it in the group. It is due to _____

- A. increase in the atomic size
- B. increase in the ionisation energy
- C. increase of effective nuclear charge
- D. all the above

Answer: c



[View Text Solution](#)

28. The total number of inner transition elements is _____

A. 14

B. 28

C. 20

D. 15

Answer: b



29. Which one of the following doesn't come under zero group?

A. he

B. k

C. ne

D. ar

Answer: b



30. The atomic number of 4 elements A,B,C and D are 8,9,10 and 11 , respectively .The order of their atomic volume is

A. $A > B > C < D$

B. $A < B < C > D$

C. $A > B < C < D$

D. $A < B > C > D$

Answer: c



View Text Solution

31. Arrange the following statements in chronological order :

A. 142

B. 1342

C. 4213

D. 2413

Answer: N/A



View Text Solution

32. The electron affinity increases on moving from left to right along a period. Arrange the reason in a proper sequence

A. 1324

B. 3241

C. 3142

D. 4321

Answer: N/A



View Text Solution

33. X belongs to IA or first row and fifth period and Y succeeds X in the group. Z succeeds Y in the period. Arrange the suitable statement in the correct sequence in order to arrange X, Y and Z in the increasing order of their atomic sizes

A. dbca

B. bdca

C. cad

D. dca

Answer: N/A



View Text Solution

34. Among third period elements halogen and alkaline earth metals are respectively

A. Cl,Na

B. S,Na

C. S,Mg

D. Cl,Mg

Answer: N/A



Watch Video Solution

35. Which among the following pairs of elements have maximum and minimum electron affinity values respectively?

A. Be,Cl

B. He,LK

C. Be,S

D. Cl,Cs

Answer: N/A



Watch Video Solution

36. Which of these triads could not be justified as Doberniener's triad?

A. Li,Na,K

B. Cl,Br,I

C. C,N,O

D. Ca,Sr,Ba

Answer: C



Watch Video Solution

37. An element belongs to IIIA group and fourth period in the modern periodic table what could be the probable atomic number of that element ?

A. 23

B. 49

C. 31

D. 13

Answer: N/A



Watch Video Solution

38. The formula of iron formed by and element A is A^{2+} . The element A can probably belong to which of the following groups?

A. IIIA

B. VIIA

C. IIA

D. IA

Answer: N/A



Watch Video Solution

39. The anomalous pairs in mendeleev 's periodic table is / are _____

A. Co,Ni

B. Te,I

C. Ar,K

D. all the above

Answer: N/A



View Text Solution

40. Which of the following triads does not follow

Dobereiner's law of triads?

A. Li,Na,K

B. Ca,Sr,Ba

C. Be,Mg,Ca

D. Cu,Ag,Au

Answer: N/A



Watch Video Solution

41. Which of the following elements do not belong to group IIA or second group

A. Be

B. Mg

C. Li

D. Ca

Answer: N/A



Watch Video Solution

42. Which of the following is not a transition element?

A. Mn

B. Fe

C. Cu

D. K

Answer: N/A



Watch Video Solution

43. Element x has 12 protons in its nucleus .To which group in the peiodic tabel would it belong?

A. IVA(14)

B. IIA((2)

C. IIIA(13)

D. VI(16)

Answer: N/A



View Text Solution

44. Element X has 12 neutrons in its nucleus. To which group in the periodic table would it belong?

A. 1

B. 2

C. 3

D. cannot be predicated

Answer: N/A



View Text Solution

45. If I_1 is the first ionisation potential I_2 is the second ionisation potential I_3 is the third ionisation potential and I_4 is the fourth

ionisation potential of an element then which of the following has the laest value?

A. I_1

B. I_2

C. I_3

D. I_4

Answer: N/A



Watch Video Solution

1. Why is the positive ion always smaller than the corresponding neutral atom?



[Watch Video Solution](#)

2. Alkaline earth metals are denser than corresponding alkali metals. Comment on the statement



[Watch Video Solution](#)

3. Why is the zero group present at the right hand side of the periodic table?



[Watch Video Solution](#)

4. why is it not possible to form Na^{+2} ions?

Explain with respect to periodic properties ?



[Watch Video Solution](#)

5. If the atomic number of some elements in the modern periodic table are 8,7,11,12,13 and 9

what type of ions do they form? Arrange the ions in the increasing order of their size and justify



[Watch Video Solution](#)

6. The densities of transition metals are greatest than those of the alkali and alkaline earth metals justify



[View Text Solution](#)

7. An element R belongs to IVA group and third period in the periodic table. Arrange the elements that are placed below R and towards right in the periodic table in increasing order of atomic size and ionisation potential



[View Text Solution](#)

8. Predict the position of the element which forms the largest cation and the smallest anion in the modern periodic table





[View Text Solution](#)

9. Why do transition metals show catalytic behaviour?



[View Text Solution](#)

10. Elements with more non metallic character are good oxidizing agents and those with more electropositive character are good reducing agents explain.



[Watch Video Solution](#)

11. An element X belongs to group II A and fourth period in the periodic table .Find out the atomic number of X and the element which is placed just below X in the periodic table



Watch Video Solution

12. Explain why the addition of an electron to a neutral atom is associated with release of

energy



[Watch Video Solution](#)

13. The first four ionisation energies of an element R are 580, 640, 1000 and 2700 k cal/mole respectively find the group number of R and write formulae of its chloride and oxide



[View Text Solution](#)

14. B and Al belong to the same group but the nature of oxides formed by them are different whereas Be and Al form same type of oxide although they belong to different groups

comment



View Text Solution

15. Chlorine Y and iodine form a Dobereiner's triad identify the atomic weight of Y



Watch Video Solution

16. Three elements X, Y and Z form a Dobriener triad. The ratio of the atomic weight of X to that of Z is 160. Find the atomic weight of X, Y and Z.



Watch Video Solution

17. The total number of electrons present in the first two and the last two shells is the same for an atom of an element X. The sum of the electrons present in the second and fourth

and fifth shells is equal to the number of electrons present in the third shell and the fifth shell is the valence shell identify x and predict its position in the periodic table



[Watch Video Solution](#)

18. The atomic number of elements x , y and z are $(a-2)$, a and $(a+2)$ respectively y is a noble gas (not helium) then

(a) predict the group to which x , y and z belong

(b) predict the formula of a molecule formed by x and z



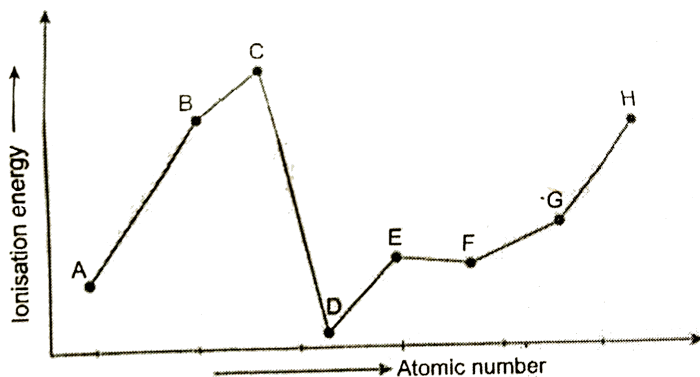
[Watch Video Solution](#)

19. Consider the isotopes of carbon i.e c-12 c-13 ,c-14 would you place them in same or different slots in the periodiodic table ? Give reason



[Watch Video Solution](#)

20. Given below is the graph representing the ionisation energies of a few element ,A to H with successive atomic number



(a) identify the noble gas

(b) which of the following elements could D be?

(c) which element has the highest electron affinity

(d) Which element has the strongest metallic character?

(e) write the unit of ionisation energy



[View Text Solution](#)

21. A physical science teacher said that work is directly proportional to force and displacement. One of the students who attended the time it foundation course said that work done in removing an electron from an atom is directly proportional to the charge

on it the teacher appreciated the student and explained the above concept what was her explanation ?



[View Text Solution](#)

22. Element A, B and C with atomic number a , $a+1$ and $z+2$ respectively form positive ions having equal number of electrons compare and contrast the size of the give reasons



[Watch Video Solution](#)

23. Elements with higher electronegativity are good oxidizing agents .Give reasons



Watch Video Solution

24. If the atomic number of some element in the modern periodic table are 8, 7, 11, 12, 13 and 9 what type of ions do they form ? Arrange the ions in the increasing order of their size and justify



View Text Solution

Level 3

1. Write the electronic configuration of the most stable cation of the element having the lowest ionisation potential value and belonging to the 4th period justify your answer



[View Text Solution](#)

2. Generally electron affinity values of elements decrease from top to bottom in a group of non-metallic elements. However

elements of 2nd period have lower electron affinity values than do the corresponding element of 3rd period .comment on this statement



[View Text Solution](#)

3. Why do alkali metals tarnish on exposure to air ?



[View Text Solution](#)

4. Electron affinity values of noble gases are zero whereas they are negative for alkaline earth metals how do you account for this ?



[View Text Solution](#)

5. Explain how the density changes across a period from K to Ni and compare it with the change down the group from K to Cs respectively



[View Text Solution](#)

6. Which element can be used in solar cells and why?



[Watch Video Solution](#)

7. Explain the energy changes involved in the formation of f and O^2 from their respective atoms



[View Text Solution](#)

8. Addition of an electron to a uninegative ion (except to VI A group elements) is an endothermic process whereas the formation of uninegative ion from its neutral atom is an exothermic process comment



[Watch Video Solution](#)

9. A, B and D are four 9th class students. Their chemistry teacher conducted a role play in the class which is as given below she assumed that A is a metal and B is a non-metal C and D

need to carry out two separate experiments for this purpose c needs an oxidizing agent and d needs a reducing agent accordingly they have to form two groups consisting of two students each how will they form the group? explain this with appropriate reasons



[View Text Solution](#)

10. Three elements A, C and C have successive atomic number in increasing order. A attains stability when an electron is added to the

third shell which is the valence shell .Identify A,B and c and predict the respective elements possessing the maximum ionisation energy oxidizing power reducing power electrons affinity and atomic size



Watch Video Solution