



WEIRD CHEMIST

d-Block Elements

Alloy Formation, Catalytic Properties, Nature of Oxide

DPP – 05

Topic: Properties of TM

Questions: 43 Questions

Exam: NEET / JEE

▶ TYPE 1 : Alloy Formation

Q1. Which of the following metals is common in gun metal, monel metal and brass alloy?

- (1) Zn (2) Cu (3) Ag (4) Fe

Q2. Gun metal contains

- (1) Cu, Sn, Zn (2) Cu, Ni (3) Cu, Ni, Fe (4) Cu, Sn, P

Q3. Which one alloy does not contain copper?

- (1) Bronze (2) Brass (3) German silver (4) Mischmetal

Q4. Which among the following alloy does not contain copper?

- (1) Brass (2) Bronze (3) German Silver (4) Invar

Q5. Alloys are formed by atoms with metallic radii that are within about—(percent of each other)

- (1) 15 (2) 50 (3) 30 (4) 75

Q6. Match the column

Column-I	Column-II
A. Nichrome	i. Cu + Al
B. Rolled gold	ii. Cu + Sn + Zn
C. Gun metal	iii. Cu + Sn
D. Bronze	iv. Ni + Fe + Cr

- (1) A–iii; B–i; C–ii; D–iv
(2) A–iv; B–i; C–ii; D–iii
(3) A–iii; B–ii; C–i; D–iv

(4) A–iv; B–iii; C–ii; D–i

Q7. Which of the following rules to prepare alloys should be obeyed?

- (1) Difference in atomic radii should be less than 15%.
- (2) Valence electron configuration should not be equal.
- (3) Atomic volume should not be the same.
- (4) Crystal lattice structure should be different.

Q8. What is the difference in atomic radii of two metallic elements to prepare alloys?

- (1) 20% (2) More than 15% (3) Less than 15% (4) 24.5%

Q9. Mn, Co, Cu metals are generally useful to prepare alloys because

- (1) The difference in their atomic volume is more than 15%.
- (2) The difference in their atomic volume is less than 2%.
- (3) The difference in their atomic volume is 15%.
- (4) The difference in their atomic volume is 2%.

Q10. Which alloy is used in preparation of coins?

- (1) Brass (2) Bronze (3) German-Silver (4) Nichrome

Q11. Which of the following alloys is used to fill dental cavities?

- (1) Sodium amalgam (2) Zinc chloride (3) Mercury (4) Mercury Amalgam

Q12. Match column-A and column-B properly.

Column-A	Column-B
1. Brass	a. Ni(60%) Cr(40%)
2. Bronze	b. Cu(80%) Sn(20%)
3. Cupronickel	c. Cu(90%) Sn(10%)
4. Nichrom	d. Cu(70%) Zn(30%)
	e. Cu(75–85%) Ni(25–15%)

- (1) 1–d; 2–c; 3–e; 4–a
- (2) 1–d; 2–c; 3–e; 4–b
- (3) 1–d; 2–e; 3–a; 4–b
- (4) 1–e; 2–c; 3–a; 4–d

Q13. Where is amalgam alloy used?

- (1) In electric heater
- (2) In space research
- (3) To make surgical appliances
- (4) In filling tooth cavity

Q14. Match Column-A and Column-B properly.

Column-A	Column-B
1. Stainless steel	a. In riveting
2. Bronze	b. In antique pieces
3. Nitinol	c. To make coins
4. German silver	d. To make surgical appliances

- (1) 1-e; 2-d; 3-b; 4-c
- (2) 1-e; 2-c; 3-b; 4-d
- (3) 1-e; 2-c; 3-a; 4-b
- (4) 1-e; 2-c; 3-a; 4-d

Q15. German silver is alloy of

- (1) Fe, Cr, Ni
- (2) Ag, Cu, Au
- (3) Cu, Zn, Ni
- (4) Cu, Zn, Sn

Q16. Which pair of elements can form an alloy?

- (1) Zn and Pb
- (2) Fe and Hg
- (3) Fe and C
- (4) C and Pt

Q17. Percentage of gold in 14 carat gold is:

- (1) 58
- (2) 80
- (3) 40
- (4) 14

Q18. Which alloy contains Cu, Sn and Zn:

- (1) Gun metal
- (2) Solder
- (3) Type metal
- (4) German silver

▶ TYPE 2 : Catalytic Properties

Q19. Match the catalyst with the process

[NEET-2019 (Odisha)]

Catalyst	Process
(i) V_2O_5	(a) The oxidation of ethyne to ethanal
(ii) $TiCl_4 + Al(CH_3)_3$	(b) Polymerisation of alkynes
(iii) $PdCl_2$	(c) Oxidation of SO_2 in the manufacture of H_2SO_4
(iv) Nickel complexes	(d) Polymerisation of ethylene

Which of the following is the correct option?

- (1) (i)-(c), (ii)-(a), (iii)-(d), (iv)-(b)
- (2) (i)-(c), (ii)-(d), (iii)-(a), (iv)-(b)
- (3) (i)-(a), (ii)-(b), (iii)-(c), (iv)-(d)
- (4) (i)-(a), (ii)-(c), (iii)-(b), (iv)-(d)

Q20. The catalytic activity of the transition metal and their compound is due to their

- (1) Chemical reactivity
- (2) Magnetic behaviour
- (3) Filled *d*-orbitals
- (4) Ability to adopt multiple oxidation state and their complexing ability

Q21. Match the column

Metal	Use
A. Misch metal	i. Production of bullets
B. Ni	ii. Vegetable oil to vegetable ghee
C. Fe	iii. Haber's process
D. Pt	iv. Catalytic oxidation of NH_3

- (1) A-i; B-ii; C-iii; D-iv
- (2) A-ii; B-i; C-iii; D-iv
- (3) A-i; B-ii; C-iv; D-iii
- (4) A-ii; B-i; C-iv; D-iii

Q22. Assertion: Transition metals are good catalyst.

Reason: V_2O_5 is used in the preparation of H_2SO_4 by contact process.

- (1) Both Assertion and Reason are true, Reason gives correct explanation
- (2) Both Assertion and Reason are true, it doesn't give correct explanation
- (3) Assertion is correct but Reason is false
- (4) Both Assertion and Reason are false

Q23. Which catalyst is used to prepare SO_3 from SO_2 in the contact process for production of

H₂SO₄?

- (1) NO (2) V₂O₅ (3) Fe (4) Ni

Q24. Which of the following statements is correct.

- (1) Transition metals and their many compounds act as good catalyst
- (2) The enthalpies of atomisation of the transition metals are high
- (3) The transition metals generally form interstitial compounds with small atoms like C, B, H etc.
- (4) All of these

Q25. Assertion: Transition metals are good catalysts.

Reason: V₂O₅ or Pt is used in the preparation of H₂SO₄ by contact process.

- (1) If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion.
- (2) If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.
- (3) If Assertion is True but the Reason is False.
- (4) If both Assertion & Reason are False.

▶ TYPE 3 : Nature of Oxide

Q26. Which of the following pairs of oxides are of basic nature?

- (1) MnO, Cr₂O₃ (3) CrO, Mn₂O₇
(2) MnO, CrO (4) CrO₃, Mn₂O₇

Q27. The basic character of the transition metal monoxides follows the order (Atomic nos. Ti = 22, V = 23, Cr = 24, Fe = 26)

- (1) VO > CrO > TiO > FeO
- (2) CrO > VO > FeO > TiO
- (3) TiO > FeO > VO > CrO
- (4) TiO > VO > CrO > FeO

Q28. Which oxide of manganese is acidic in nature?

- (1) MnO (2) Mn₂O₇ (3) Mn₂O₃ (4) MnO₂

Q29. Which of the following statement is correct for 3d-transition elements?

- (1) All the metals except Sc form 'MO' oxide
- (2) All the metals except Zn form 'MO' oxide
- (3) All the metals except Zn and Sc form 'MO' oxide
- (4) All the metals except Mn form 'MO' oxide

Q30. Which of the following oxides is ionic?

- (1) MnO (2) Mn₂O₇ (3) CrO₃ (4) P₂O₅

Q31. Which statement is true:

Statement (ii) as transcribed from the source gives VO₄⁺ as the acid-medium product; the standard textbook species is the dioxovanadium(V) cation VO₂⁺. Kept as written in your notes – worth double-checking against your source.

- (i) CrO is basic and Cr₂O₃ is amphoteric.
(ii) V₂O₅ reacts with alkalis as well as acids to give VO₄³⁻ & VO₄⁺ respectively.
(iii) V₂O₄ dissolved in acid to give VO²⁺ salts

- (1) i and ii (2) ii and iii (3) only iii (4) all are true

Q32. Which oxide of manganese is most acidic in nature?

- (1) MnO (2) Mn₂O₇ (3) Mn₂O₃ (4) MnO₂

Q33. Which of the following is an amphoteric oxide? Mn₂O₇, CrO₃, Cr₂O₃, CrO, V₂O₅, V₂O₄

- (1) V₂O₅, Cr₂O₃ (2) Mn₂O₇, CrO₃ (3) CrO, V₂O₅ (4) V₂O₅, V₂O₄

Q34. Which one of the following is an amphoteric oxide?

- (i) Mn₂O₇
(ii) CrO
(iii) MnO₂
(iv) Cr₂O₃

- (1) i and ii (2) ii, iii and iv (3) iii and iv (4) i and iv

Q35. Arrange the following in increasing order of acidic character: Mn₂O₇(A), Mn₂O₃(B), MnO(C)

- (1) C, A, B (2) A, C, B (3) B, A, C (4) C, B, A

Q36. The basic character of the transition metal monoxides follows the order:–

- (1) CrO > VO > FeO > TiO
(2) TiO > FeO > VO > CrO
(3) TiO > VO > CrO > FeO
(4) VO > CrO > TiO > FeO

Q37. Which of the following is an acidic oxide?

- (1) Mn_2O_7 (2) Mn_3O_4 (3) MnO (4) Mn_2O_3

Q38. Which is not amphoteric?

- (1) Al^{3+} (2) Cr^{3+} (3) Fe^{2+} (4) Zn^{2+}

Q39. Which of the following oxides of chromium is amphoteric in nature:–

- (1) CrO (2) Cr_2O_3 (3) CrO_3 (4) CrO_5

Q40. Which of the following is an amphoteric oxide? Mn_2O_7 , CrO_3 , Cr_2O_3 , CrO , V_2O_5 , V_2O_4 :–

- (1) V_2O_5 , Cr_2O_3 (2) Mn_2O_7 , CrO_3 (3) CrO , V_2O_5 (4) V_2O_5 , V_2O_4

Q41. Which of the following have maximum and minimum ionic character out of MnO , MnF_2 , MnO_2 , Mn_2O_7 ?

- (1) MnO , Mn_2O_7 respectively
 (2) MnF_2 , Mn_2O_7 respectively
 (3) MnO_2 , MnO respectively
 (4) Mn_2O_7 , MnO respectively

Q42. Among the oxides Mn_2O_7 (I), V_2O_3 (II), V_2O_5 (III), CrO (IV) and Cr_2O_3 (V) the basic oxides are.

- (1) I and II (2) II and III (3) III and IV (4) II and IV

Q43. Match the column

Column-I	Column-II
(A) Metal of the $3d$ -series which does not form MO type oxide.	(p) Manganese
(B) Metal of the $3d$ -series which forms most covalent oxide	(q) Vanadium
(C) Metal of the $3d$ -series which forms the amphoteric oxide.	(r) Scandium

- (1) A – p; B – r; C – q
 (2) A – r; B – p; C – q
 (3) A – r; B – q; C – p
 (4) A – q; B – q; C – r