

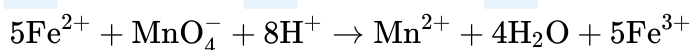
Q1 2021 (01 Sep Shift 2)

Identify the element for which electronic configuration in +3 oxidation state is $[\text{Ar}]3d^5$:

- (1) Ru
- (2) Mn
- (3) Co
- (4) Fe

Q2 2021 (01 Sep Shift 2)

In the given chemical reaction, colors of the Fe^{2+} and Fe^{3+} ions, are respectively :



- (1) Yellow, Orange
- (2) Yellow, Green
- (3) Green, Orange
- (4) Green, Yellow

Q3 2021 (31 Aug Shift 2)

The Eu^{2+} ion is a strong reducing agent in spite of its ground state electronic configuration (outermost):

[Atomic number of Eu = 63]

- (1) $4f^7 6s^2$
- (2) $4f^6$
- (3) $4f^7$
- (4) $4f^6 6s^2$

Q4 2021 (31 Aug Shift 1)

Which one of the following lanthanides exhibits +2 oxidation state with diamagnetic nature ?

(Given Z for Nd = 60, Yb = 70, La = 57, Ce = 58)

- (1) Nd

(2) Yb

(3) La

(4) Ce

Q5 2021 (31 Aug Shift 1)

In the structure of the dichromate ion, there is a :

(1) linear symmetrical Cr – O – Cr bond.

(2) non-linear symmetrical Cr – O – Cr bond.

(3) linear unsymmetrical Cr – O – Cr bond.

(4) non-linear unsymmetrical Cr – O – Cr bond.

Q6 2021 (27 Aug Shift 2)

Potassium permanganate on heating at 513 K gives a product which is :

(1) paramagnetic and colourless

(2) diamagnetic and green

(3) diamagnetic and colourless

(4) paramagnetic and green

Q7 2021 (27 Aug Shift 2)

Which one of the following is used to remove most of plutonium from spent nuclear fuel?

(1) ClF_3

(2) O_2F_2

(3) I_2O_5

(4) BrO_3

Q8 2021 (27 Aug Shift 1)

The number of f electrons in the ground state electronic configuration of Np ($Z = 93$) is _____.

(Nearest integer)

Q9 2021 (27 Aug Shift 1)

The nature of oxides V_2O_3 and CrO is indexed as 'X' and 'Y' type respectively. The correct set of X and Y is:

(1) X = basic Y = amphoteric

(2) X = amphoteric Y = basic

(3) X = acidic Y = acidic

(4) X = basic Y = basic

Q10 2021 (26 Aug Shift 1)

The number of $4f$ electrons in the ground state electronic configuration of Gd^{d+} is _____.

[Atomic number of Gd = 64]

Q11 2021 (26 Aug Shift 1)

Which one of the following when dissolved in water gives coloured solution in nitrogen atmosphere?

(1) $CuCl_2$

(2) $AgCl$

(3) $ZnCl_2$

(4) Cu_2Cl_2

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Answer Key

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Q1 (4)

Q2 (4)

Q3 (3)

Q4 (2)

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Q5 (2)

Q6 (4)

Q7 (2)

Q8 (4)

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Q9 (4)

Q10 (7)

Q11 (1)

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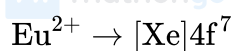
Q1 (4)



Q2 (4)

Colour of Fe^{2+} is observed green and Fe^{3+} is yellow.

Q3 (3)

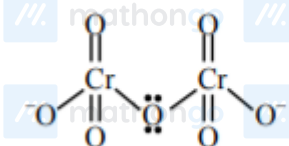


Q4 (2)

Ytterbium shows +2 oxidation state with diamagnetic nature.

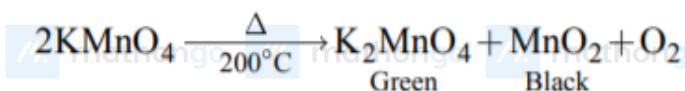
So ans is 2.

Q5 (2)



dichromate ion contain non-linear symmetrical Cr-O-Cr Bond

Q6 (4)



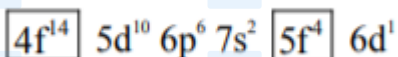
In K_2MnO_4 , manganese oxidation state is +6 and hence it has one unpaired e^- .

Q7 (2)

O_2 F_2 oxidises plutonium to PuF_6 and the reaction is used in removing plutonium as PuF_6 from spent nuclear fuel.

Q8 (4)

$$Np = 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2$$



Total no. of 'f' electron = $14e^- + 4e^- = 18$

Q9 (4)

V_2O_3 basic

CrO basic

Q10 (7)

The electronic configuration of

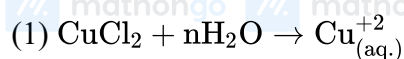


So the electronic configuration of

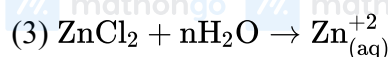


i.e. the number of 4f electrons in the ground state electronic configuration of Gd^{2+} is 7.

Q11 (1)



blue colour



Colourless

