Questions

Q1 - 25 July - Shift 1

The IUPAC nomenclature of an element with electronic configuration $[Rn]5f^{14}6d^{1}7s^{2}$ is :

(A) Unnilbium (B) Unnilunium

(C) Unnilquadium (D) Unniltrium

Space for your notes:

Q2 - 25 July - Shift 2

The first ionization enthalpies of Be, B, N and O follow the order

(A) O < N < B < Be (B) Be < B < N < O

(C) B < Be < N < O (D) B < Be < O < N

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Q3 - 26 July - Shift 1

Given two statements below :

Statement I : In Cl_2 molecule the covalent radius is double of the atomic radius of chlorine.

Statement II : Radius of anionic species is always greater than their parent atomic radius.

Choose the **most appropriate** answer from options given below :

(A) Both Statement I and Statement II are correct.

(B) Both Statement I and Statement II are incorrect.

(C) Statement I is correct but Statement II is incorrect.

(D) Statement I is incorrect but Statement II is correct.

Space for your notes:

Q4 - 27 July - Shift 2

Questions

Outermost electronic configurations of four elements A, B, C, D are given below:

(A) $3s^2$

(B) $3s^2 3p^1$

(C) $3s^2 3p^3$

(D) $3s^2 3p^4$

The **correct** order of first ionization enthalpy for them is:

(A) (A) < (B) < (C) < (D)

(B) (B) < (A) < (D) < (C)

(C) (B) < (D) < (A) < (C)

(D) (B) < (A) < (C) < (D)

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Q5 - 28 July - Shift 1

In which of the following pairs, electron gain enthalpies of constituent elements are nearly the same or identical ?

(A) Rb and Cs (B) Na and K

(C) Ar and Kr (D) I and At

Choose the correct answer from the options given below :

(A) (A) and (B) only

(B) (B) and (C) only

(C) (A) and (C) only

(D) (C) and (D) only

Space for your notes:

Q6 - 28 July - Shift 2

Questions

The correct decreasing order for metallic character is

(A) Na > Mg > Be > Si > P

(B) P > Si > Be > Mg > Na

(C) Si > P > Be > Na > Mg

(D) Be > Na > Mg > Si > P

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Q7 - 29 July - Shift 1

Which of the following pair of molecules contain odd electron molecule and an expanded octet molecule?

(A) BCl_3 and SF_6 (B) NO and H_2SO_4

(C) SF_6 and H_2SO_4 (D) BCl_3 and NO

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Q8 - 29 July - Shift 1

The first ionization enthalpy of Na, Mg and Si, respectively, are: 496, 737 and 786 kJ mol^{-1}. The first ionization enthalpy (kJ mol^{-1}) of Al is:

(A) 487 (B) 768

(C) 577 (D) 856

Space for your notes:

Questions

Answer Key

Q1 (D) **Q2** (D) **Q3** (D) **Q4** (B)

Q5 (C) **Q6** (A) **Q7** (B) **Q8** (C)

Hints and Solutions

Q1 (D)

Atomic Number 103

Q2 (D)

1^{st} I.E. $\underset{(2p^3)}{N} > \underset{(2p^4)}{O} > \underset{(2s^2)}{Be} > \underset{(2p^1)}{B}$

Q3 (D)

In Cl_2 molecule, the covalent radius is half of the internuclear distance, so statement(I) is false.

For the same element, anion has lower effective nuclear charge than atom $\Rightarrow$ so anion is larger than atom. $\Rightarrow$ statement (II) is correct.

Q4 (B)

Hints and Solutions

(A) $3s^2 \rightarrow Mg$

(B) $3s^2 3p^1 \rightarrow Al$

(C) $3s^2 3p^3 \rightarrow P$

(D) $3s^2 3p^4 \rightarrow S$

$\underbrace{P > S}_{\text{Half filled stability}} > \underbrace{Mg > Al}_{\text{Penetrating power of s>p.}}$

$C > D > A > B.$

Q5 (C)

Rb & Cs have nearly same electron gain enthalpy

electron gain enthalpy = – 46 kj/ml

Ar & Kr have same ΔH_{eq}. Value is + 96 kj/ml

Q6 (A)

Across a period metallic character decreases

Q7 (B)

(A) $BCl_3 \rightarrow$ Even Electron molecule

$SF_6 \rightarrow$ Expanded octet molecule

(B) $NO \rightarrow$ Odd Electron molecule

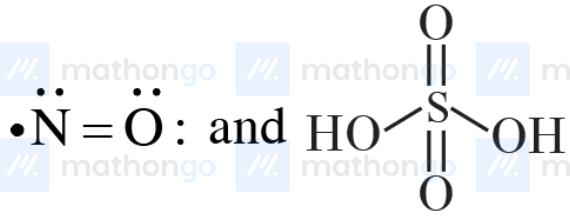
$H_2SO_4 \rightarrow$ Expanded octet.

(C) $SF_6 \rightarrow$ Even Electron molecule

$H_2SO_4 \rightarrow$ Expanded octet.

(D) $BCl_3 \rightarrow$ Even Electron molecule

$NO \rightarrow$ Odd Electron molecule



and

$S \rightarrow 12e^-$ in outer orbit.

Q8 (C)

I. E : Na < Al < Mg < Si

$\therefore$ 496 < IE (Al) < 737

Option (C), matches the condition.

i.e $IE(Al) = 577\ kJmol^{-1}$