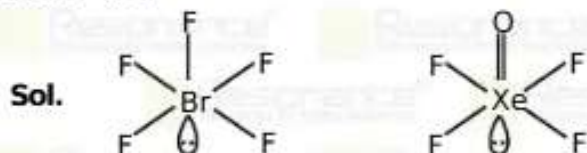


PART : CHEMISTRY

1. The molecules having square pyramidal geometry are
 (1) SbF_5 and PCl_5 (2) BrF_5 and XeOF_4 (3) BrF_5 and PCl_5 (4) SbF_5 and XeOF_4

Ans. (2)



2. The incorrect decreasing order of atomic radii :
 (1) $\text{Si} > \text{P} > \text{Cl} > \text{F}$ (2) $\text{Mg} > \text{Al} > \text{C} > \text{O}$ (3) $\text{Al} > \text{B} > \text{N} > \text{F}$ (4) $\text{Be} > \text{Mg} > \text{Al} > \text{Si}$

Ans. (4)

Sol. Watch vedio solution

3. A 50 g solution contains 1 g of solute the depression in freezing point of solution is 0.41 K. Find K_f (Molecular weight of solute = 256 g/mol)

- (1) 5.0176 K-Kg/Mol (2) 5.14 K-Kg/Mol (3) 5.2 K-Kg/Mol (4) 5.3 K-Kg/Mol

Ans. (2)

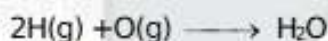
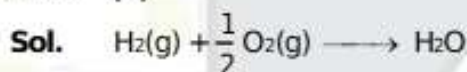
Sol. $\Delta T_f = K_f m$

$$0.41 = K_f = \frac{0.41 \times 256 \times 49}{1000} = 5.14 \text{ K-Kg/Mol}$$

4. ΔH_f° of $\text{H}(\text{g})$ is 222 kJ/mol, ΔH_f° of $\text{O}(\text{g})$ is 250 kJ/mol ΔH_f° of H_2O is -248 kJ/mol. What is the bond energy of O-H bond of H_2O in kJ/mol

- (1) 471 kJ/mol (2) 480 kJ/mol (3) 500 kJ/mol (4) None of these

Ans. (1)



$$\Delta H_{rxn} = (\Delta H_f^\circ)_{\text{H}_2\text{O}} - (\Delta H_f^\circ)_{\text{H}_2} - \frac{1}{2}(\Delta H_f^\circ)_{\text{O}_2}$$

$$= 2 \times 222 + 250 - 2E_{\text{O-H}}$$

$$-248 = 444 + 250 - 2E_{\text{O-H}}$$

$$\frac{-248 - 694}{2} = -2E_{\text{O-H}}$$

$$= \frac{942}{2} = +471 \text{ kJ/mol}$$

5. Which of the following set of Quantum number have same energy

- (a) $n = 2, \ell = 2, m = \pm 1$ (b) $n = 2, \ell = 1, m = -1$

- (c) $n = 3, \ell = 2, m = 0$ (d) $n = 3, \ell = 2, m = 1$

- (1) a, b (2) b, c (3) c, d (4) a, c

Ans. (3)

Sol. c and d set of quantum number have equal value of $n + \ell$, so energy is equal.

6. 70 % by mass solution of HNO_3 is taken having density 1.20 gm/ml. Calculate molarity (Round off)
Ans. (13)

Sol. Molarity = $\frac{\left(\frac{70}{63}\right)}{\left(\frac{100}{1.20}\right)} \times 1000 = 13.33 \approx 13$

7. Match the following column and choose the correct option :

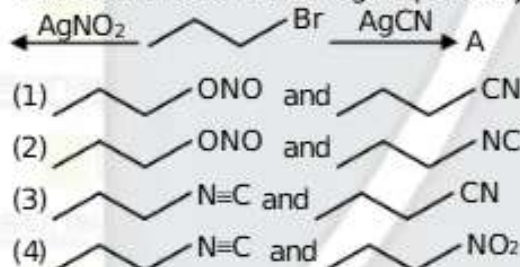
Column - I		Column - II	
(A)	$\text{H}_2\text{O}_2 \longrightarrow \text{H}_2\text{O} + \text{O}_2$	(P)	Combination reaction
(B)	$\text{NaH} \longrightarrow \text{Na} + \text{H}_2$	(Q)	Disproportionation reaction
(C)	$\text{CH}_4 + \text{O}_2 \longrightarrow \text{CO}_2 + \text{H}_2\text{O}$	(R)	Decomposition reaction
(D)	$\text{Fe} + \text{CuSO}_4 \longrightarrow \text{FeSO}_4 + \text{Cu}$	(S)	Displacement reaction

- (1) (A) → (Q) ; (B) → (P) ; (C) → (R) ; (D) → (S)
 (2) (A) → (R) ; (B) → (Q) ; (C) → (S) ; (D) → (P)
 (3) (A) → (Q) ; (B) → (R) ; (C) → (P) ; (D) → (S)
 (4) (A) → (R) ; (B) → (Q) ; (C) → (P) ; (D) → (S)

Ans. (3)

Sol. Watch vedio solution

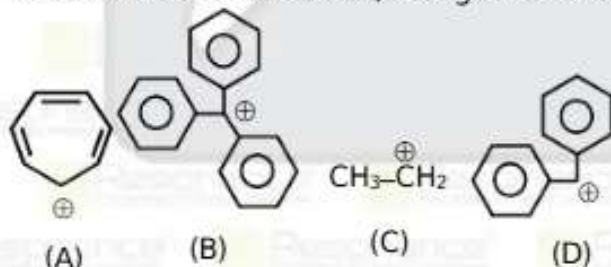
8. Product A and B in following respectively.



Ans. (4)

Sol. Watch vedio solution

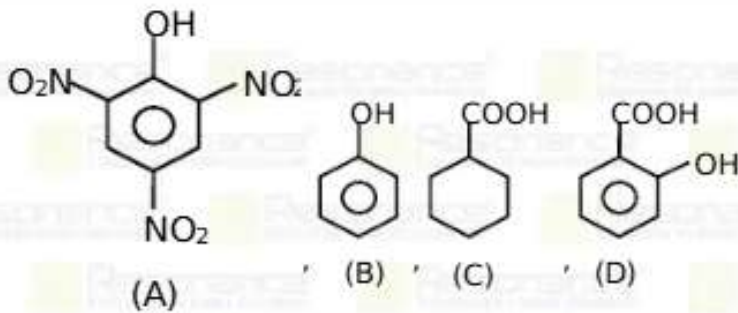
9. Which of them is most stable/Arrange them in decreasing order.



- (1) (A) > (B) > (D) > (C) (2) (B) > (C) > (D) > (A)
 (3) (A) > (B) > (C) > (D) (4) (B) > (C) > (A) > (D)

Ans. (1)

Sol. Watch vedio solution

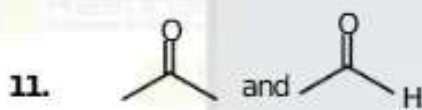


How many of them evolve CO_2 with NaHCO_3

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

Ans. (2)

Sol. Watch vedio solution

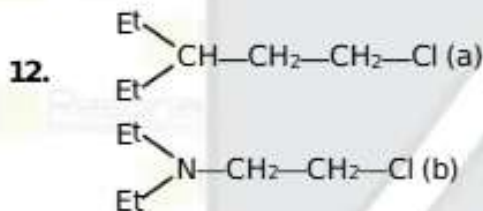


How many reagents will give positive test with both above molecules.

- (A) Aldol condensation
(B) Cannizaro
(C) Clemmenson reaction
(D) Iodoform
(E) Tollen
(F) Fehling

Ans. (3)

Sol. Watch vedio solution



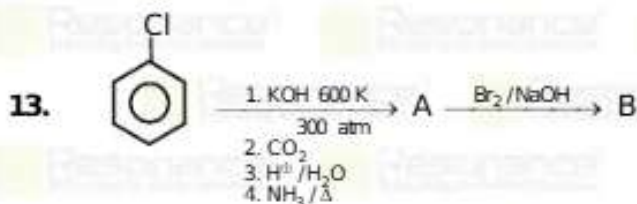
S-I : (A) has more rate of reaction than (b) finds reaction 2.

S-II : Intra molecular reaction is given by (B) hence rate of reaction increases.

- (1) Both Statement I and statement II are true
(2) Both statement I and statement II are false
(3) Statement I is true but statement II is false
(4) Statement I is false but statement II is true

Ans. (4)

Sol. Watch vedio solution



Find x. Molar mass of B is x:

Ans. (109)

Sol. Watch vedio solution