

**P-BLOCK**

- Among the following reactions of hydrogen with halogens, the one that requires a catalyst is :  
(1)  $\text{H}_2 + \text{I}_2 \rightarrow 2\text{HI}$       (2)  $\text{H}_2 + \text{F}_2 \rightarrow 2\text{HF}$   
(3)  $\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$    (4)  $\text{H}_2 + \text{Br}_2 \rightarrow 2\text{HBr}$
- Which of the following is not an example of heterogeneous catalytic reaction ?  
(1) Ostwald's process  
(2) Haber's process  
(3) Combustion of coal  
(4) Hydrogenation of vegetable oils
- Diborane ( $\text{B}_2\text{H}_6$ ) reacts independently with  $\text{O}_2$  and  $\text{H}_2\text{O}$  to produce, respectively  
(1)  $\text{HBO}_2$  and  $\text{H}_3\text{BO}_3$    (2)  $\text{H}_3\text{BO}_3$  and  $\text{B}_2\text{O}_3$   
(3)  $\text{B}_2\text{O}_3$  and  $\text{H}_3\text{BO}_3$    (4)  $\text{B}_2\text{O}_3$  and  $[\text{BH}_4]^-$
- The one that is extensively used as a piezoelectric material is :  
(1) Quartz                              (2) Amorphous silica  
(3) Mica                                 (4) Tridymite
- The amorphous form of silica is :  
(1) quartz                              (2) kieselguhr  
(3) cristobalite                        (4) tridymite
- The correct statements among I to III regarding group 13 element oxides are,  
(I) Boron trioxide is acidic.  
(II) Oxides of aluminium and gallium are amphoteric.  
(III) Oxides of indium and thallium are basic.  
(1) (I), (II) and (III)      (2) (II) and (III) only  
(3) (I) and (III) only      (4) (I) and (II) only
- The correct order of catenation is :  
(1)  $\text{C} > \text{Si} > \text{Ge} \approx \text{Sn}$    (2)  $\text{C} > \text{Sn} > \text{Si} \approx \text{Ge}$   
(3)  $\text{Ge} > \text{Sn} > \text{Si} > \text{C}$    (4)  $\text{Si} > \text{Sn} > \text{C} > \text{Ge}$
- The synonym for water gas when used in the production of methanol is :-  
(1) natural gas                        (2) laughing gas  
(3) syn gas                              (4) fuel gas

## SOLUTION

1. **Ans. (1)**
2. **Ans. (3)**  
Then is no catalyst is required for combustion of coal.
3. **Ans.(3)**  
$$\text{B}_2\text{H}_6 + 3\text{H}_2\text{O} \longrightarrow 2\text{H}_3\text{BO}_3 + 3\text{H}_2$$
$$\text{B}_2\text{H}_6 + 3\text{O}_2 \longrightarrow \text{B}_2\text{O}_3 + 3\text{H}_2\text{O}$$
Correct option : (3)
4. **Ans. (1)**  
Quartz (Information)
5. **Ans.(2)**  
Kieselguhr is amorphous form of silica, it's a fact

6. **Ans.(1)**  
All statements are correct  
 $\text{B}_2\text{O}_3 \rightarrow$  acidic  
 $\text{Al}_2\text{O}_3$  &  $\text{Ga}_2\text{O}_3$  are amphoteric  
oxides of In & Tl are basic
7. **Ans.(1)**  
As we move down the group, bond strength decreases, thereby decreasing the catenation tendency.  
Hence the order is as expected  
 $\text{C} > \text{Si} > \text{Ge} \approx \text{Sn}$
8. **Ans.(3)**  
water gas =  $\text{CO} + \text{H}_2$   
is also called syn gas because it is used for synthesis of methanol.