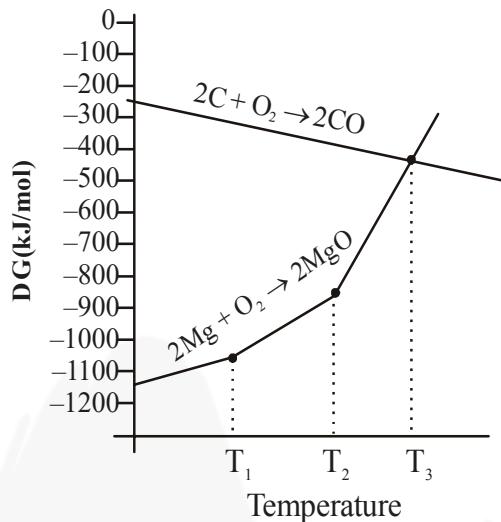


Only One Correct Answer :

1. Select the **incorrect** statements about the plot is / are:



- (A) T_1 and T_2 are melting point & boiling point of Mg respectively.
 (B) T_1 and T_2 are melting point & boiling point of MgO respectively.
 (C) Reduction of MgO by coke is possible above T_3
 (D) Mg can be extracted from gaseous products by rapid cooling.
2. For same above question find the correct statement regarding ΔG°
 (A) After T_1 point $|\Delta G^\circ|$ decreases (B) After T_2 point $|\Delta G^\circ|$ increases
 (C) After both points $|\Delta G^\circ|$ decreases (D) Both (A) and (C) are correct
3. For the reactions at $1500^\circ C$,
 $2C + O_2 \rightarrow 2CO \quad \Delta G^\circ \approx -530 \text{ kJ}$
 $2MgO \rightarrow 2Mg + O_2 \quad \Delta G^\circ \approx +730 \text{ kJ}$
- Find the correct option :
- (A) MgO can be reduced by carbon at this temperature
 (B) For the reaction $MgO + C \rightarrow Mg + CO$ ΔG° is negative
 (C) For the reaction $2M + O_2 \rightarrow 2MO$ (Where M = Mg, C) ΔG° is more negative for Mg
 (D) None of these
4. Based on Ellingham diagram which of the following statement is **CORRECT** :
 (A) Slope of graph for most of the metals is down wards
 (B) On increasing temperature magnitude of ΔG° decreases
 (C) On increasing temperature free energy change increases
 (D) Both (B) and (C) options are correct

(Inorganic Chemistry)

METALLURGY

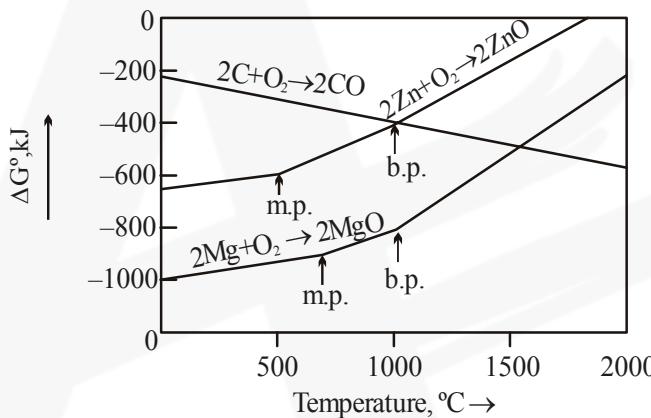
5. Which of the following is the principal reducing agent for the reduction of Fe_2O_3 :
- (A) CO (B) C (C) CO_2 (D) None of these

More than one correct :

6. Graph for metal M_2 is above to the graph for M_1 metal in Ellingham diagram, based on this fact find the **INCORRECT** option. (Both graphs do not intersect each other at any point)
- (A) Metal M_2 can reduce the oxide of metal M_1
 (B) Metal M_1 can reduce the oxide of metal M_2
 (C) Both metals can reduce oxides of each other at certain temperature
 (D) Metal M_1 can't reduce the oxide of metal M_2

Comprehension (Q.7 to Q.10)

Questions given below are based on the given diagram for extractive metallurgy.



The points noted by arrows are the melting and boiling points of the metals zinc and magnesium. ΔG° as a function of temperature for some reactions of extractive metallurgy.

7. At what approximate temperature, zinc and carbon have equal affinity for oxygen?
- (A) 1000°C (B) 1500°C (C) 500°C (D) 1200°C
8. At this temperature ΔG° of the reaction is : $\text{ZnO} + \text{C} \longrightarrow \text{Zn} + \text{CO}$
- (A) - ve (B) +ve (C) zero (D) nothing can be said
9. To make the following reduction process spontaneous, temperature should be :
 $\text{ZnO} + \text{C} \longrightarrow \text{Zn} + \text{CO}$
- (A) $< 1000^\circ\text{C}$ (B) $> 1100^\circ\text{C}$ (C) $< 500^\circ\text{C}$ (D) $> 500^\circ\text{C}$ but $< 1000^\circ\text{C}$
10. At 1100°C , which reaction is spontaneous to a maximum extent?
- (A) $\text{MgO} + \text{C} \longrightarrow \text{Mg} + \text{CO}$ (B) $\text{ZnO} + \text{C} \longrightarrow \text{Zn} + \text{CO}$
 (C) $\text{MgO} + \text{Zn} \longrightarrow \text{Mg} + \text{ZnO}$ (D) $\text{ZnO} + \text{Mg} \longrightarrow \text{MgO} + \text{Zn}$



ANSWER KEY

DPP - 03

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|----|-----|----|-----|-----|-----|----|-----|----|-----|----|-----------|----|-----|
| 1. | (B) | 2. | (D) | 3. | (C) | 4. | (D) | 5. | (A) | 6. | (A, C, D) | 7. | (A) |
| 8. | (C) | 9. | (B) | 10. | (D) | | | | | | | | |