

**Olimpiada de Chimie
Etapa națională**

Barem de corectare – Clasa a X-a

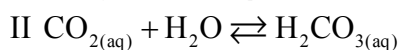
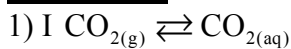
Subiectul I

10 p

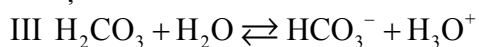
I	b	VI	b
II	c	VII	c
III	a	VIII	c
IV	a	IX	c
V	c	X	c

Subiectul II

24 p



În soluție



4 p

2) și 3)

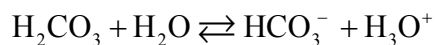
La 0 m $[\text{CO}_2]_{(aq)} = 9,918 \cdot 10^{-6} \text{ M}$

2,5 p

La 8 000 m $[\text{CO}_2]_{(aq)} = 3,967 \cdot 10^{-6} \text{ M}$

2,5 p

Deoarece $k_{a1} \gg k_{a2}$, pH-ul se calculează ținând seama numai de echilibrul III.



$$k_{a1} = \frac{[\text{HCO}_3^-][\text{H}_3\text{O}^+]}{[\text{H}_2\text{CO}_3]}$$

4 p

La 0 m $4,31 \cdot 10^{-7} = \frac{x^2}{9,918 \cdot 10^{-6} - x}$

$x = 1,86 \cdot 10^{-6} \text{ M}$

4 p

La 8 000 m $4,31 \cdot 10^{-7} = \frac{x^2}{3,967 \cdot 10^{-6} - x} \Rightarrow x = 1,11 \cdot 10^{-6} \text{ M}$

4 p

pH = 5,95

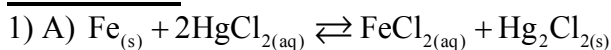
1 p

4) Închiderea vasului

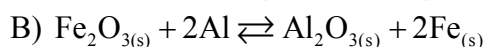
1 p

Subiectul III

20 p



3 p



2 p

- 2) 90,10% Fe₂O₃
 2,37% Fe
 7,56% impurități inerte chimic 7 p
- 3) $Q = 141,66 \text{ kJ}$ 4 p
- 4) $\Delta t = 6,23^\circ\text{C}$
 temperatura finală 33,23°C 4 p

Subiectul IV **9 p**

- 1) Cu | CuSO₄ (1M)
 Ni | NiSO₄ (1M)
 Cd | CdSO₄ (1M) 3 p
- 2) Cd | CdSO₄ (1M) || Cu | CuSO₄ (1M) | Cu
 Ni | NiSO₄ (1M) || Cu | CuSO₄ (1M) | Cu
 Cd | CdSO₄ (1M) || Ni | NiSO₄ (1M) | Ni 3 p
- 3) Cd | CdSO₄ (1M) || Cu | CuSO₄ (1M) | Cu
 $E_{\text{Cd}} = 0,740 \text{ V}$ 3 p

Se acordă 7 puncte din oficiu.