

**1. ISPITNA KNJIŽICA (ZADATCI ZATVORENOG TIP)**

|       |       |
|-------|-------|
| 1. D  | 21. C |
| 2. B  | 22. B |
| 3. D  | 23. D |
| 4. A  | 24. C |
| 5. D  | 25. B |
| 6. A  | 26. C |
| 7. C  | 27. A |
| 8. B  | 28. D |
| 9. C  | 29. D |
| 10. C | 30. A |
| 11. C | 31. C |
| 12. B | 32. B |
| 13. D | 33. A |
| 14. C | 34. D |
| 15. D | 35. B |
| 16. C | 36. B |
| 17. B | 37. D |
| 18. A | 38. A |
| 19. D | 39. A |
| 20. A | 40. C |

**2. ISPITNA KNJIŽICA (ZADATCI 'OTVORENOG' TIP)**

**1.A.**

- 1.1. kalijev dikromat (kalijev bikromat)
- 1.2. natrijev oktadekanoat (natrijev stearat, natrijeva sol stearinske kiseline)
- 1.3. litijev hidrid

**1.B.**

- 1.4.  $\text{Ca}_3(\text{PO}_4)_2$
- 1.5.  $\text{Sr}(\text{OH})_2$
- 1.6.  $(\text{NH}_4)_2\text{SO}_3$

**1 BOD** za svaki točan odgovor

**2.**

- 2.1. sublimacija
- 2.2. tamnosiv metalnog sjaja (sive, crne)

**1 BOD** za svaki točan odgovor

**3.**

- 3.1. kromatografiranje (tankoslojna kromatografija)
- 3.2. dekantiranje
- 3.3. filtriranje
- 3.4. ekstrahiranje

**1 BOD** za svaki točan odgovor

**4.**

- 4.1. četverostrana (kvadratna, tetragonska) piramida
- 4.2. planarna (trigonska planarna)

4.3. tetraedarska

4.4. linearna

4.5. trostrana piramida (trigonska piramida)

4.6. oktaedarska

1 BOD za svaki točan odgovor

5.

5.1.

$$\begin{aligned}
 n(\text{CH}_3\text{COOH}) &= 2 \cdot n(\text{CaCO}_3) \\
 &= \frac{2 \cdot 500 \text{ g}}{100 \text{ g mol}^{-1}} \\
 &= 10,0 \text{ mol}
 \end{aligned}$$

$$\begin{aligned}
 m(\text{CH}_3\text{COOH}) &= n(\text{CH}_3\text{COOH}) \cdot M(\text{CH}_3\text{COOH}) \\
 &= 10,0 \text{ mol} \cdot 60,0 \text{ g mol}^{-1} \\
 &= 600 \text{ g}
 \end{aligned}$$

$$\begin{aligned}
 c &= \frac{\rho \cdot w(\text{CH}_3\text{COOH, otopina})}{M(\text{CH}_3\text{COOH})} \\
 V &= \frac{n(\text{CH}_3\text{COOH})}{c} \\
 V &= \frac{n(\text{CH}_3\text{COOH}) \cdot M(\text{CH}_3\text{COOH})}{\rho \cdot w(\text{CH}_3\text{COOH, otopina})}
 \end{aligned}$$

$$w(\text{CH}_3\text{COOH, otopina}) = \frac{m(\text{CH}_3\text{COOH})}{\rho \cdot V}$$

$$\begin{aligned}
 V &= \frac{m(\text{CH}_3\text{COOH})}{\rho \cdot w} = \frac{600 \text{ g}}{1,05 \text{ g mL}^{-1} \cdot 0,09} \\
 &= 6349 \text{ mL} \\
 &= 6,35 \text{ L}
 \end{aligned}$$

5.1.1. 1 BOD za pravilan stehiometrijski omjer

5.1.2. 1 BOD za ispravno izračunatu masu (ili množinsku koncentraciju)  $\text{CH}_3\text{COOH}$ 

5.1.3. 1 BOD za ispravno izračunat volumen otopine

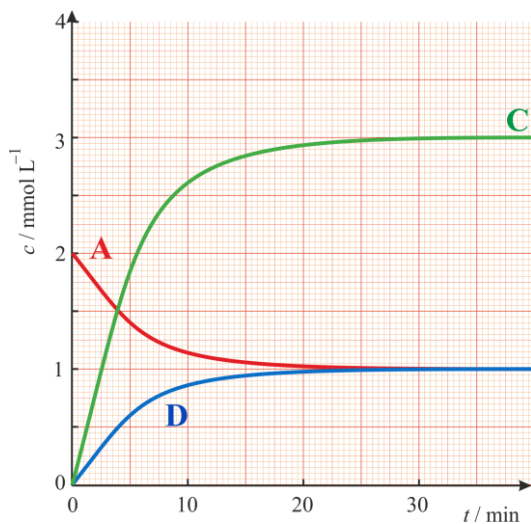
5.2.



1 BOD za svaki točan zapis JKR sa ili bez AS

6.

6.1.



6.1.1. **1 BOD** promjena množinske koncentracije tvari A

6.1.2. **1 BOD** promjena množinske koncentracije tvari C

6.1.3. **1 BOD** promjena množinske koncentracije tvari D

**6.2.**

$$K_c = \frac{[C]^3 \cdot [D]}{[A]} = \frac{(3 \text{ mmol/L})^3 \cdot (1 \text{ mmol/L})}{1 \text{ mmol/L}} = 27 \text{ mmol}^3 \text{ L}^{-3}$$

6.2.1. **1 BOD** za ispravno napisan izraz za koncentracijsku konstantu ravnoteže

6.2.2. **1 BOD** za ispravno izračunatu konstantu kemijske reakcije

**6.3.** →, pomak ravnoteže prema produktima, u desno, bolje iskorištenje reakcije

**1 BOD**

**7.**

**7.1.**  $\text{HCOOH} + \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH} \rightarrow \text{HCOOCH}_2\text{CH}_2\text{CH}_2\text{CH}_3 + \text{H}_2\text{O}$

**1 BOD**

**7.2.** esteri

**1 BOD**

**7.3.**  $(\text{CH}_3)_3\text{COH}$ , prihvaća se bilo koja ispravno napisana formula *tert*-butanola

**1 BOD**

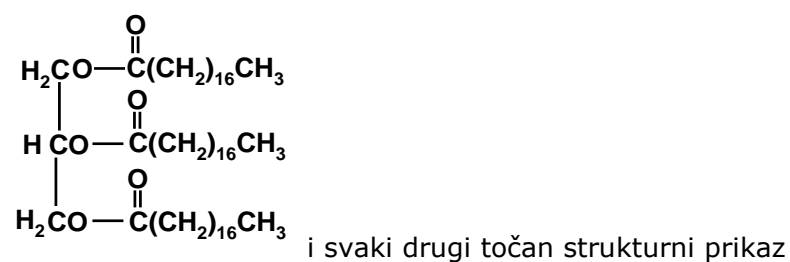
**7.4.**  $\text{HCOOH}(\text{aq}) + \text{NaOH}(\text{aq}) \rightarrow \text{HCOONa}(\text{aq}) + \text{H}_2\text{O}(\text{l})$

**1 BOD** za svaki točan zapis JKR sa ili bez AS

**7.5.** otopina je lužnata ili  $\text{pH} > 7$

**1 BOD**

**7.6.**



**1 BOD**

**8.**

**8.1.**  $2 \text{Cl}^- \rightarrow \text{Cl}_2 + 2 \text{e}^-$

**1 BOD**

**8.2.**  $\text{K}^+ + \text{e}^- \rightarrow \text{K}$

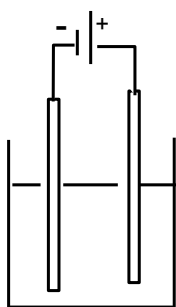
**1 BOD**

**8.3.**

$$\begin{aligned} Q &= F \cdot n \\ &= 96\,500 \text{ C mol}^{-1} \cdot 1 \text{ mol} \\ &= 96\,500 \text{ C} \\ &= 9,65 \times 10^4 \text{ C} \end{aligned}$$

**1 BOD**

**8.4.**



**1 BOD** za sve nacrtane elemente (elektrolit, elektrode, izvor struje)

**9.**

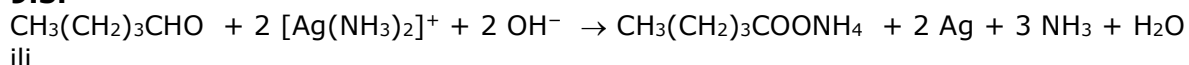
**9.1.** aldehidima

**1 BOD**

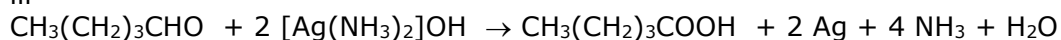
**9.2.**  $\text{CH}_3(\text{CH}_2)_3\text{CHO}$  ili  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CHO}$

**1 BOD**

**9.3.**



ili



**1 BOD** za svaki točan zapis JKR sa ili bez AS

**9.4.**  $(\text{CH}_3)_3\text{CCHO}$  i svaki točan zapis strukturne formule

**1 BOD**

**9.5.** 2,2-dimetilpropanal

**1 BOD**

**9.6.** aldehidi, ketoni, karboksilne kiseline, aminokiseline, amidi, esteri, kiselinski halogenidi, anhidridi organskih kiselina, ugljikohidrati, masti, ulja...

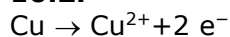
**1 BOD** za tri ili više točnih navoda

**10.**

**10.1.**  $\text{CuSO}_4$  ili  $\text{Cu}^{2+}$ ,  $\text{SO}_2$  i  $\text{H}_2\text{O}$

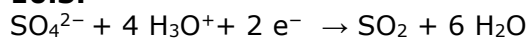
**1 BOD** za navedene sve produkte reakcije

**10.2.**

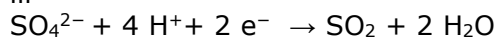


**1 BOD**

**10.3.**

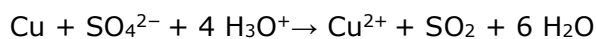


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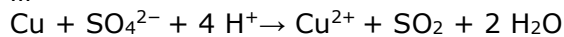


**1 BOD**

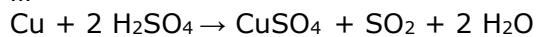
**10.4.**



ili



ili



**1 BOD** za sumarnu JKR u ionskom ili makroskopskom zapisu

**11.**

**11.1.**

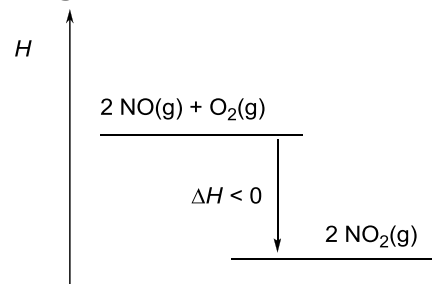
$$K_p = \frac{p^2(\text{NO}_2)}{p^2(\text{NO}) \cdot p(\text{O}_2)} \quad \text{ili} \quad K_p = \frac{p(\text{NO}_2)^2}{p(\text{NO})^2 \cdot p(\text{O}_2)}$$

**1 BOD**

**11.2.** jedinke produkta ili  $\text{NO}_2$

**1 BOD**

**11.3.**



**1 BOD**

**11.4.**

$$v = \frac{\Delta c(\text{NO}_2)}{2 \Delta t}$$

**1 BOD**

**12.**

**12.1.**

$$c(\text{NaOH}) = \frac{n(\text{NaOH})}{V(\text{otopina})} = \frac{m(\text{NaOH})}{M(\text{NaOH}) \cdot V(\text{otopina})}$$

$$= \frac{0,50 \text{ g}}{40,0 \text{ g mol}^{-1} \cdot 5,0 \text{ L}} = 2,5 \times 10^{-3} \text{ mol L}^{-1}$$

$$c(\text{NaOH}) = c(\text{OH}^-)$$

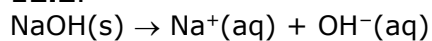
$$\begin{aligned} \text{pOH} &= -\log c(\text{OH}^-)/\text{mol L}^{-1} \\ &= -\log 2,5 \times 10^{-3} \text{ mol L}^{-1}/\text{mol L}^{-1} \\ &= 2,6 \end{aligned}$$

$$\text{pH} = 14,0 - 2,6 = \underline{11,4}$$

12.1.1. **1 BOD** za izračun množinske koncentracije

12.1.2. **1 BOD** za izračun pH-vrijednosti

**12.2.**



$$n(\text{NaOH}) = \frac{m(\text{NaOH})}{M(\text{NaOH})} = \frac{0,50 \text{ g}}{40,0 \text{ g mol}^{-1}} = 0,0125 \text{ mol}$$

$$\begin{aligned} N(\text{iona}) &= N_A \cdot n \cdot 2 \\ &= 6,022 \times 10^{23} \text{ mol}^{-1} \cdot 0,0125 \text{ mol} \cdot 2 \\ &= \underline{1,5 \times 10^{22}} \end{aligned}$$

**1 BOD**

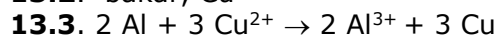
**12.3.** elektrolitna otopina ili vodič drugoga reda

**1 BOD**

**13.**

**13.1.** magnezij, Mg

**13.2.** bakar, Cu



**13.4.** bakrovi ioni,  $\text{Cu}^{2+}$

**1 BOD** za svaki točan odgovor