

KLJUČ ZA ODGOVORE - KEMIJA - jesenski rok 2014.

1. Ispitna knjižica (Zadatci višestrukog izbora)

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

2. Ispitna knjižica (Zadatci kratkog odgovora, zadatci dopunjavanja i zadatci produženog odgovora)

- 1.A.1. željezov(III) sulfid
- 1.A.2. hipoklorasta kiselina (hipokloritna kiselina)
- 1.A.3. natrijev acetat trihidrat
- 1.B.4. $\text{CH}_2\text{OHCH}_2\text{OH}$
- 1.B.5. C_9H_{20}
- 1.B.6. $\text{K}_2\text{Cr}_2\text{O}_7$

1 BOD za svaki točan odgovor

- 2.1. E
- 2.2. A
- 2.3. F
- 2.4. C

1 BOD za svaki točan odgovor

- 3.1. selenij
- 3.2. skandij
- 3.3. Sc^{3+}
- 3.4. natrij, Na

1 BOD za svaki točan odgovor

4.	sol	$m(\text{sol}) / \text{g}$	$t / ^\circ\text{C}$	NEZASIĆENA OTOPINA	ZASIĆENA OTOPINA	PREZASIĆENA OTOPINA
4.1.	KCl	60	70			X
4.2.	NaCl	20	80	X		
4.3.	KNO_3	80	50		X	
4.4.	KClO_3	10	10			X

1 BOD za svaki točan odgovor

5.1. C₂H₄O

$$w(X, \text{ spoj}) = \frac{N(X) \cdot A_r(X)}{M_r(\text{ spoj})}$$

$$N(X) = \frac{w(X, \text{ spoj}) \cdot M_r(\text{ spoj})}{A_r(X)}$$

$$N(\text{C}) = \frac{w(\text{C}) \cdot M_r(\text{ spoj})}{A_r(\text{C})} = \frac{0,5455 \cdot 44,04}{12,0} = 2,0$$

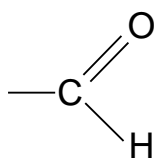
$$N(\text{H}) = \frac{w(\text{H}) \cdot M_r(\text{ spoj})}{A_r(\text{H})} = \frac{0,0909 \cdot 44,04}{1,01} = 4,0$$

$$N(\text{O}) = \frac{w(\text{O}) \cdot M_r(\text{ spoj})}{A_r(\text{O})} = \frac{0,3636 \cdot 44,04}{16,0} = 1,0$$

1 BOD za izraz $N(X)$ (ili ispravan postupak rješavanja)

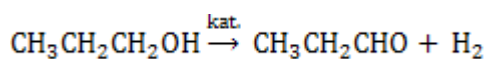
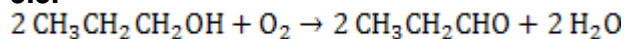
1 BOD za točno izračunatu molekulsku formulu

5.2.



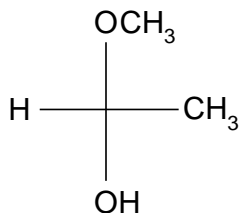
1 BOD

5.3.

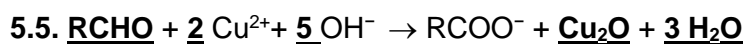


1 BOD za jednu od navedenih JKR

5.4.



1 BOD



1 BOD

6.1. $\alpha = 0,0016 \%$

$$K_a = \frac{[\text{C}_6\text{H}_5\text{O}^-] \cdot [\text{H}_3\text{O}^+]}{[\text{C}_6\text{H}_5\text{OH}]}$$

$$[\text{C}_6\text{H}_5\text{OH}] = c_0(\text{C}_6\text{H}_5\text{OH}) - x \approx c_0(\text{C}_6\text{H}_5\text{OH})$$

$$[\text{C}_6\text{H}_5\text{O}^-] = [\text{H}_3\text{O}^+] = x$$

$$K_a = \frac{x \cdot x}{c_0(\text{C}_6\text{H}_5\text{OH})}$$

$$x^2 = K_a \cdot c_0(\text{C}_6\text{H}_5\text{OH})$$

$$x = \sqrt{K_a \cdot c_0(\text{C}_6\text{H}_5\text{OH})}$$

$$x = \sqrt{1,3 \times 10^{-10} \text{ mol dm}^{-3} \cdot 0,5 \text{ mol dm}^{-3}} = 8,06 \times 10^{-6} \text{ mol dm}^{-3}$$

$$[\text{C}_6\text{H}_5\text{O}^-] = [\text{H}_3\text{O}^+] = 8,06 \times 10^{-6} \text{ mol dm}^{-3}$$

$$\alpha = \frac{[\text{C}_6\text{H}_5\text{O}^-]}{c_0(\text{C}_6\text{H}_5\text{OH})} = \frac{8,06 \times 10^{-6} \text{ mol dm}^{-3}}{0,5 \text{ mol dm}^{-3}} = 1,61 \times 10^{-5} = 0,0016 \%$$

6.1.1. 1 BOD za točno napisan izraz za K_a

6.1.2. 1 BOD za točan odnos $[\text{C}_6\text{H}_5\text{O}^-]$ i $[\text{H}_3\text{O}^+]$

6.1.3. 1 BOD za točno izračunati x

6.1.4. 1 BOD za točno izračunati stupanj disocijacije, α

6.2. $\text{C}_6\text{H}_5\text{O}^-$

1 BOD

6.3. $\text{C}_6\text{H}_5\text{O}^-(\text{aq}) + \text{H}_2\text{O}(\ell) \rightarrow \text{C}_6\text{H}_5\text{OH}(\text{aq}) + \text{OH}^-(\text{aq})$

1 BOD

7.1. B

1 BOD

7.2.

$2 \text{ A} \rightarrow \text{D}$

1 BOD

7.3. korak (1)

1 BOD

7.4.

$$\boxed{v = -\frac{\Delta c(\text{A})}{\Delta t} \quad \text{ili} \quad v = \frac{\Delta c(\text{E})}{\Delta t}}$$

1 BOD

8.1. $c = 4 \times 10^{-4} \text{ mol dm}^{-3}$; pH = 10,6

$$n_1 = n_2 \quad c_1 \cdot V_1 = c_2 \cdot V_2$$
$$c_2 = \frac{c_1 \cdot V_1}{V_2} = \frac{0,01 \text{ mol dm}^{-3} \cdot 0,01 \text{ dm}^3}{0,25 \text{ dm}^3} = 0,0004 \text{ mol dm}^{-3}$$

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

$$\text{pOH} = -\log[c(\text{OH}^-) / \text{mol dm}^{-3}] = 3,4$$

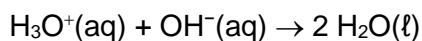
$$\text{pOH} = 14 - 3,4 = 10,6$$

1 BOD za postupak, odnosno za odnos množina

1 BOD za točno izračunatu množinsku koncentraciju NaOH(aq)

1 BOD za točno izračunatu pH-vrijednost

8.2. 4 mL



$$n(\text{H}^+) = 2 \cdot n(\text{H}_2\text{SO}_4) = 2 \cdot 1 \times 10^{-4} \text{ mol dm}^{-3} \cdot 200 \times 10^{-3} \text{ dm}^3 = 4 \times 10^{-5} \text{ mol}$$

$$n(\text{H}^+) = n(\text{OH}^-) = n(\text{NaOH}) = 4 \times 10^{-5} \text{ mol}$$

$$V(\text{NaOH}) = \frac{n(\text{NaOH})}{c(\text{NaOH})} = \frac{4 \times 10^{-5} \text{ mol}}{1 \times 10^{-2} \text{ mol dm}^{-3}} = 4 \times 10^{-3} \text{ dm}^3 = 4 \text{ cm}^3 = 4 \text{ mL}$$

1 BOD za točno postavljen odnos množina H^+ i OH^- iona (kisline i lužine)

1 BOD za točno izračunatu množinu OH^- iona (lužine)

1 BOD za točno izračunat volumen vodene otopine B

9.1.	OZNAKA	ODGOVOR
9.A.	A	Na
9.B.	B	$\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl}$
9.C.	C	$\text{CH}_3\text{CH}_2\text{COOH}$
9.D.	D	$\text{CH}_3\text{CH}=\text{CH}_2$ ili $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_2\text{CH}_3$

1 BOD za svaki točan odgovor

9.2. eliminacija, dehidratiranje

1 BOD

9.3. (nukleofilnoj) supstituciji

1 BOD

10.1. E

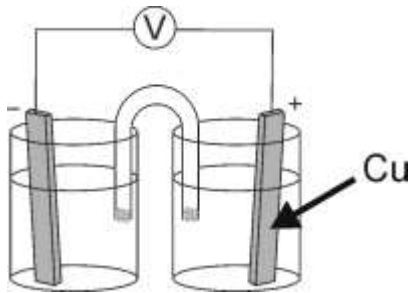
10.2. C

10.3. A

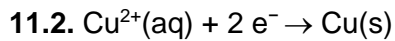
10.4. D

1 BOD za svaki točan odgovor

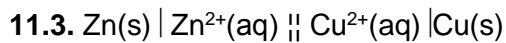
11.1.



1 BOD za dobro obilježenu elektrodu



1 BOD



1 BOD

11.4. $-0,76 \text{ V}$

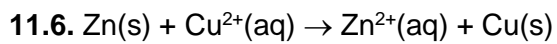
$$\Delta E = E^{\circ}(\text{Cu}^{2+} | \text{Cu}) - E^{\circ}(\text{Zn}^{2+} | \text{Zn})$$

$$E^{\circ}(\text{Zn}^{2+} | \text{Zn}) = E^{\circ}(\text{Cu}^{2+} | \text{Cu}) - \Delta E = 0,34 \text{ V} - 1,10 \text{ V} = -0,76 \text{ V}$$

1 BOD za točan rezultat sa ili bez postupka

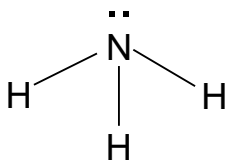
11.5. Daniellov članak

1 BOD

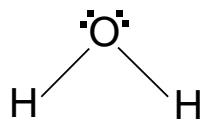


1 BOD

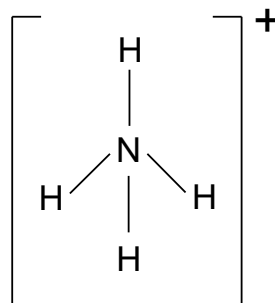
12.



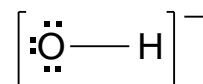
12.1.



12.2.



12.3.



12.4.

1 BOD za svaku točno nacrtanu Lewisovu strukturnu formulu