



RJEŠENJA ISPITA DRŽAVNE MATURE IZ **KEMIJE**
U ŠKOLSKOJ GODINI 2023./2024. (1. rok)

ISPITNA KNJIŽICA 1

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



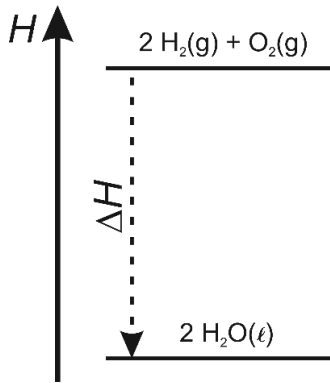
ISPITNA KNJIŽICA 2

BROJ ZADATKA	TOČAN ODGOVOR	BOD
1.1.	prop-2-en-1-ol	1 BOD
1.2.	NaOCl	1 BOD
2.	<p>Molekulska formula: M_2O_3</p> <p>$w(O, M_3O_4) = 0,276$, $w(M, M_3O_4) = 0,724$</p> $w(M, M_3O_4) = \frac{3 A_r(M)}{3 A_r(M) + 4 A_r(O)}$ $0,724 = \frac{3 A_r(M)}{3 A_r(M) + 64,0}$ $A_r(M) = 56,0$ <p>$w(O, M_3O_4) = 0,300$, $w(M, M_3O_4) = 0,700$</p> $N(M) : N(O) = \frac{w(M)}{A_r(M)} : \frac{w(O)}{A_r(O)} = \frac{0,700}{56,0} : \frac{0,300}{16,0} = 0,01250 : 0,01875$ $N(M) : N(O) = 0,01250 : 0,01875 = 2 : 3$ <p>Molekulska formula: M_2O_3</p>	<p>1 BOD</p> <p>1 BOD</p>
3.1.	<p>$\gamma(C_{12}H_{22}O_{11}) = 0,8554 \text{ g cm}^{-3}$</p> $\gamma(C_{12}H_{22}O_{11}) = w(C_{12}H_{22}O_{11}) \cdot \rho(\text{otopine}) = 0,65 \cdot 1,316 \text{ g cm}^{-3}$ $\gamma(C_{12}H_{22}O_{11}) = 0,8554 \text{ g cm}^{-3}$	1 BOD
3.2.	<p>$p(\text{otopine}) = 3,126 \text{ kPa}$</p> $n(C_{12}H_{22}O_{11}) = \frac{20,00 \text{ g}}{342,22 \text{ g mol}^{-1}} = 0,05848 \text{ mol}$ $n(H_2O) = \frac{80,00 \text{ g}}{18,02 \text{ g mol}^{-1}} = 4,440 \text{ mol}$ $\sum n = 4,499 \text{ mol}$ $x(H_2O) = \frac{4,440 \text{ mol}}{4,499 \text{ mol}} = 0,9869$ $p(\text{otopine}) = 3,167 \text{ kPa} \cdot 0,9869 = 3,126 \text{ kPa}$	1 BOD



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4.1.	$\text{HNO}_2 + \text{H}_2\text{O} \rightleftharpoons \text{NO}_2^- + \text{H}_3\text{O}^+$	1 BOD
4.2.	$K_a = 6,3 \cdot 10^{-4} \text{ mol L}^{-1}$ $[\text{NO}_2^-] = [\text{H}_3\text{O}^+] = \alpha c_0$ $[\text{HNO}_2] = c_0 - \alpha c_0 = c_0(1 - \alpha)$ $K_a = \frac{\alpha^2 c_0^2}{c_0(1 - \alpha)} = \frac{\alpha^2 c_0}{1 - \alpha} = \frac{(0,076)^2 \cdot 0,1 \text{ mol L}^{-1}}{1 - 0,076}$ $K_a = 6,3 \cdot 10^{-4} \text{ mol L}^{-1}$	1 BOD
5.1.	$t = 70^\circ\text{C}$ $w(\text{sol}) = \frac{m(\text{sol})}{m(\text{sol}) + m(\text{H}_2\text{O})}$ $0,375 = \frac{m(\text{sol})}{m(\text{sol}) + 100 \text{ g}}$ $m(\text{sol}) = 60 \text{ g}$ Temperatura iznosi 70°C .	1 BOD
5.2.	Nezasićena otopina. $\frac{15 \text{ g}}{70 \text{ g}} = \frac{m}{100 \text{ g}} \Rightarrow m = \frac{15 \text{ g} \cdot 100 \text{ g}}{70 \text{ g}} = 21 \text{ g}$ Topljivost soli pri 40°C iznosi 21 g u 100 g vode. Iz dijagrama je očitano da topljivost soli pri 40°C iznosi 47 g u 100 g vode iz čega proizlazi da je vodena otopina soli nezasićena.	1 BOD
6.1.	$Q = -10,6 \times 10^5 \text{ kJ}$ $Q = \xi \cdot \Delta_r H = \frac{\Delta m(\text{H}_2) \cdot \Delta_r H}{M(\text{H}_2) \cdot \nu(\text{H}_2)}$ $Q = \frac{-7,5 \times 10^3 \text{ g} \cdot (-571,68 \text{ kJ mol}^{-1})}{2,02 \text{ g mol}^{-1} \cdot (-2)} = -10,6 \times 10^5 \text{ kJ}$	1 BOD

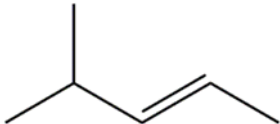
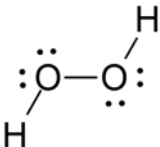


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6.2.		1 BOD
6.3.	$V(\text{H}_2) = 0,13 \text{ m}^3$ $V(\text{H}_2) = \frac{m(\text{H}_2) \cdot R \cdot T(\text{H}_2)}{M(\text{H}_2) \cdot p(\text{H}_2)}$ $V(\text{H}_2) = \frac{7500 \text{ g} \cdot 8,31 \text{ Pa m}^3 \text{ K}^{-1} \text{ mol}^{-1} \cdot 298 \text{ K}}{2,02 \text{ g mol}^{-1} \cdot 700 \times 10^5 \text{ Pa}} = 0,13 \text{ m}^3$	1 BOD
7.1.	$\text{HC} \equiv \text{CH} + \text{HCl} \xrightarrow{\text{Hg}^{2+}} \text{H}_2\text{C}=\text{CHCl}$	1 BOD
7.2.	$n(\text{HCl}) = 24 \text{ mol}$ $n(\text{HCl}) = n(\text{C}_2\text{H}_3\text{Cl})$ $n(\text{C}_2\text{H}_3\text{Cl}) = \frac{m(\text{C}_2\text{H}_3\text{Cl})}{M(\text{C}_2\text{H}_3\text{Cl})} = \frac{1,5 \times 10^3 \text{ g}}{62,5 \text{ g mol}^{-1}} = 24 \text{ mol}$	1 BOD
7.3.	inhibiraju adiciju klorovodika na vinil-klorid ili inhibiraju nastanak 1,1-dikloreтана	1 BOD
8.1.	Članak A: $2 \text{H}_2\text{O} \rightarrow \text{O}_2 + 4 \text{H}^+ + 4 \text{e}^-$ Članak B: $2 \text{Cl}^- \rightarrow \text{Cl}_2 + 2 \text{e}^-$	1 BOD 1 BOD



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8.2.	$m(\text{Ag}) = 10,8 \text{ g}$ $\frac{n(\text{Ag})}{n(\text{Cu})} = \frac{z(\text{Cu})}{z(\text{Ag})}$ $m(\text{Ag}) = \frac{z(\text{Cu}) \cdot m(\text{Cu}) \cdot M(\text{Ag})}{M(\text{Cu}) \cdot z(\text{Ag})} = \frac{2 \cdot 3,18 \text{ g} \cdot 108 \text{ g mol}^{-1}}{63,5 \text{ g mol}^{-1} \cdot 1}$ $m(\text{Ag}) = 10,8 \text{ g}$	1 BOD
9.1.	$\text{NaOH} + \text{CH}_3\text{COOH} \rightarrow \text{CH}_3\text{COONa} + \text{H}_2\text{O}$	1 BOD
9.2.	$c(\text{H}_3\text{O}^+) = 10^{-4} \text{ mol dm}^{-3}$ $V(\text{NaOH}) = 25 \text{ mL} \Rightarrow$ očitanjem iz grafa vidi se da je $\text{pH} = 4$ $c(\text{H}_3\text{O}^+) = 10^{-\text{pH}} \text{ mol dm}^{-3} = 10^{-4} \text{ mol dm}^{-3}$	1 BOD
9.3.	bezbojna	1 BOD
9.4.	$\text{CH}_3\text{COO}^- + \text{H}_2\text{O} \rightleftharpoons \text{CH}_3\text{COOH} + \text{OH}^-$	1 BOD
10.1.	$3 \text{ H}_2 + \text{N}_2 \rightleftharpoons 2 \text{ NH}_3$	1 BOD
10.2.	$p(\text{H}_2) = \sqrt[3]{\frac{p^2(\text{NH}_3)}{p^3(\text{N}_2) \cdot K_p}}$ $p(\text{H}_2) = \sqrt[3]{\frac{(0,2 \text{ bar})^2}{0,2 \text{ bar} \cdot 1,6 \times 10^{-4} \text{ bar}^{-2}}}$ $p(\text{H}_2) = 10,8 \text{ bar}$	1 BOD
10.3.	U reakcijskoj smjesi povećava se koncentracija reaktanata.	1 BOD
10.4.	NH_4^+	1 BOD
11.1.	adiciji	1 BOD
11.2.	$\text{CH}_3\text{CHICHICH}(\text{CH}_3)_2$	1 BOD



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11.3.	otopina se obezboji	1 BOD
11.4.		1 BOD
12.1.	$\text{H}_2\text{O}_2 + 2 \text{H}^+ + 2 \text{e}^- \rightarrow 2 \text{H}_2\text{O}$	1 BOD
12.2.		1 BOD
12.3.	$\bar{v} = 3,3 \times 10^{-3} \text{ mol dm}^{-3} \text{ s}^{-1}$ $\bar{v} = \frac{1}{\nu(\text{I}^-)} \cdot \frac{\Delta c(\text{I}^-)}{\Delta t}$ $\bar{v} = -\frac{1}{3} \cdot \frac{(0,55 \text{ mol dm}^{-3} - 0,75 \text{ mol dm}^{-3})}{20 \text{ s}}$ $\bar{v} = 3,3 \times 10^{-3} \text{ mol dm}^{-3} \text{ s}^{-1}$	1 BOD
12.4.	linearan	1 BOD