

**RJEŠENJA ISPITA IZ KEMIJE NA LJETNOM ROKU**  
**DRŽAVNE MATURE SERIJE D-S043**

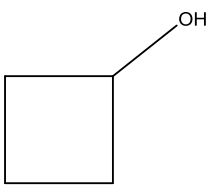
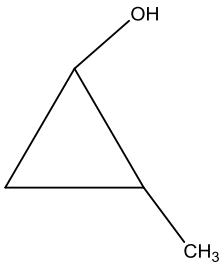
**Srpanj 2020.**

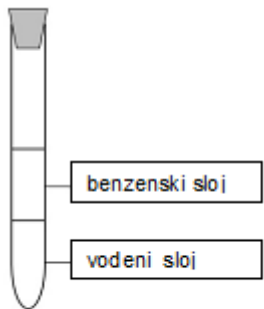
**ISPITNA KNJIŽICA 1**

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

## ISPITNA KNJIŽICA 2

Redni broj	Odgovor:	Bod
1.1.	propan-1,2,3-triol (glicerol)	1 BOD
1.2.	Cu <sub>2</sub> S	1 BOD
2.	<p><b><math>b = 17,89 \text{ mol kg}^{-1}</math></b></p> <p><b><math>t_L = -33,3 \text{ °C}</math> ili <math>T_L = 239,7 \text{ K}</math></b></p> <p><math>m(\text{C}_2\text{H}_6\text{O}_2) = \rho \cdot V = 1110 \text{ g dm}^{-3} \cdot 1 \text{ dm}^3 = 1110 \text{ g}</math>  <math>m(\text{H}_2\text{O}) = \rho \cdot V = 1 \text{ kg dm}^{-3} \cdot 1 \text{ dm}^3 = 1 \text{ kg}</math></p> $b = \frac{n(\text{C}_2\text{H}_6\text{O}_2)}{m(\text{H}_2\text{O})} = \frac{m(\text{C}_2\text{H}_6\text{O}_2)}{M(\text{C}_2\text{H}_6\text{O}_2) \cdot m(\text{H}_2\text{O})} = \frac{1110 \text{ g}}{62,06 \text{ g mol}^{-1} \cdot 1 \text{ kg}}$ $= 17,89 \text{ mol kg}^{-1}$ <p><math>\Delta T = i \cdot K_f \cdot b = 1 \cdot 1,86 \text{ K kg mol}^{-1} \cdot 17,89 \text{ mol kg}^{-1} = 33,3 \text{ K}</math></p> <p><math>t_L = 0 \text{ °C} - 33,3 \text{ °C} = -33,3 \text{ °C}</math>  <math>T_L = 273 \text{ K} - 33,3 \text{ K} = 239,7 \text{ K}</math></p>	<p>1 BOD</p> <p>1 BOD</p>
3.1.	<p><math>\text{CH}_3\text{CH}_2\text{COOH}(\text{aq}) + \text{H}_2\text{O}(\text{l}) \rightleftharpoons \text{CH}_3\text{CH}_2\text{COO}^-(\text{aq}) + \text{H}_3\text{O}^+(\text{aq})</math></p> <p>ili</p> <p><math>\text{CH}_3\text{CH}_2\text{COOH}(\text{aq}) \rightleftharpoons \text{CH}_3\text{CH}_2\text{COO}^-(\text{aq}) + \text{H}^+(\text{aq})</math></p>	1 BOD
3.2.	<p><math>c_0(\text{CH}_3\text{CH}_2\text{COOH}) = c(\text{CH}_3\text{CH}_2\text{COOH})</math></p> $K_a = \frac{c(\text{H}_3\text{O}^+) \cdot c(\text{CH}_3\text{CH}_2\text{COO}^-)}{c_0(\text{CH}_3\text{CH}_2\text{COOH})}$ $K_a = \frac{(\alpha \cdot c_0(\text{CH}_3\text{CH}_2\text{COOH}))^2}{c_0(\text{CH}_3\text{CH}_2\text{COOH})}$ $K_a = \alpha^2 \cdot c_0(\text{CH}_3\text{CH}_2\text{COOH})$ $\alpha = \sqrt{\frac{K_a}{c_0(\text{CH}_3\text{CH}_2\text{COOH})}} = \sqrt{\frac{1,34 \times 10^{-5} \text{ mol L}^{-1}}{1,0 \text{ mol L}^{-1}}} = 3,66 \times 10^{-3}$ <p><math>\alpha = 3,66 \times 10^{-3} \cdot 100 = 0,366 \%</math></p> <p><math>\alpha = 0,366 \%</math></p>	1 BOD

4.1.	 ili 	1 BOD
4.2.	$w(\text{H}, \text{C}_4\text{H}_8\text{O}) = \frac{N \cdot A_r(\text{H})}{M_r(\text{C}_4\text{H}_8\text{O})} = \frac{8 \cdot 1,01}{72,08} = 0,112 \cdot 100 = 11,2 \%$	1 BOD
5.1.	$\bar{v}(\text{NO}_2) = \frac{\Delta c(\text{NO}_2)}{\Delta t} = \frac{c_2(\text{NO}_2) - c_1(\text{NO}_2)}{\Delta t}$	1 BOD
5.2.	$\bar{v} = -\frac{1}{2} \cdot \frac{c_2 - c_1}{\Delta t} = -\frac{1}{2} \cdot \frac{(4,460 \times 10^{-2} - 4,537 \times 10^{-2}) \text{ mol L}^{-1}}{80 \text{ s}} = 4,813 \times 10^{-6} \text{ mol L}^{-1} \text{ s}^{-1}$	1 BOD
6.1.	bireta i Erlenmeyerova tikvica	1 BOD
6.2.	naranačasto-crvenu	1 BOD
6.3.	$\text{H}_3\text{O}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow 2 \text{H}_2\text{O}(\ell)$ ili $2 \text{HCl}(\text{aq}) + \text{Ba}(\text{OH})_2(\text{aq}) \rightarrow \text{BaCl}_2(\text{aq}) + 2 \text{H}_2\text{O}(\ell)$ ili $\text{H}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\ell)$	1 BOD
7.1.	$p(\text{O}_2) = 21 \text{ kPa}$ $p(\text{O}_2) = x(\text{O}_2) \cdot p(\text{zrak}) = 0,21 \times 10^5 \text{ Pa} = 2,1 \times 10^4 \text{ Pa} = 21 \text{ kPa}$	1 BOD
7.2.	$M_r = x(\text{N}_2) \cdot M_r(\text{N}_2) + x(\text{O}_2) \cdot M_r(\text{O}_2) + x(\text{ostali plinovi}) \cdot A_r(\text{Ar})$ $M_r = 0,78 \cdot 28 + 0,21 \cdot 32 + 0,01 \cdot 39,9 = 28,96$	1 BOD

7.3.	$\varphi(\text{Ar, zrak}) = \frac{V(\text{Ar})}{V(\text{zrak})} = \frac{9\,300\text{ L}}{10^6\text{ L}} = 0,0093 \cdot 100 = 0,93\%$	1 BOD
8.1.	aerosol	1 BOD
8.2.	<p> <math>n(\text{Zn}) = 0,076\text{ mol}, n(\text{NH}_4\text{NO}_3) = 0,062\text{ mol}</math>  <math>m(\text{H}_2\text{O}) = 2,23\text{ g}</math> </p> $n(\text{Zn}) = \frac{m(\text{Zn})}{M(\text{Zn})} = \frac{5,0\text{ g}}{65,4\text{ g mol}^{-1}} = 0,076\text{ mol}$ $n(\text{NH}_4\text{NO}_3) = \frac{m(\text{NH}_4\text{NO}_3)}{M(\text{NH}_4\text{NO}_3)} = \frac{5,0\text{ g}}{80,04\text{ g mol}^{-1}} = 0,062\text{ mol}$ <p>Mjerodavni reaktant je: amonijev nitrat.</p> $n(\text{H}_2\text{O}) : n(\text{NH}_4\text{NO}_3) = 2 : 1$ $n(\text{H}_2\text{O}) = 2 \cdot n(\text{NH}_4\text{NO}_3)$ $= 2 \cdot 0,062\text{ mol} = 0,124\text{ mol}$ $m(\text{H}_2\text{O}) = n \cdot M = 0,124\text{ mol} \cdot 18,02\text{ g mol}^{-1} = 2,23\text{ g}$	1 BOD 1 BOD
9.1.		1 BOD
9.2.	ljubičast	1 BOD
9.3.	Londonove sile (inducirani dipol – inducirani dipol)	1 BOD
9.4.	$\frac{n(\text{CO}_2)}{n(\text{C}_6\text{H}_6)} = \frac{6}{1}$ $m(\text{CO}_2) = \frac{6 \cdot m(\text{C}_6\text{H}_6) \cdot M(\text{CO}_2)}{M(\text{C}_6\text{H}_6)} = \frac{6 \cdot 0,5\text{ g} \cdot 44\text{ g mol}^{-1}}{78,06\text{ g mol}^{-1}} = 1,7\text{ g}$	1 BOD

10.1.	$[\text{Kr}] 4d^{10} 5s^1$ ili $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 4d^{10} 5s^1$	1 BOD
10.2.	$\text{Ag}^+(\text{aq}) + \text{Cl}^-(\text{aq}) \rightarrow \text{AgCl}(\text{s})$ ili $\text{AgNO}_3(\text{aq}) + \text{NaCl}(\text{aq}) \rightarrow \text{AgCl}(\text{s}) + \text{NaNO}_3(\text{aq})$	1 BOD
10.3.	diamminsrebrov(I) ion (ili kation)	1 BOD
10.4.	$K_c = \frac{c([\text{Ag}(\text{NH}_3)_2]^+)}{c(\text{Ag}^+) \cdot c^2(\text{NH}_3)} = \frac{0,034 \text{ mol dm}^{-3}}{0,002 \text{ mol dm}^{-3} \cdot (0,001 \text{ mol dm}^{-3})^2} =$ $= 1,7 \times 10^7 \text{ dm}^6 \text{ mol}^{-2}$ $K_c = 1,7 \times 10^7 \text{ dm}^6 \text{ mol}^{-2}$	1 BOD
11.1.	Gustoća plina X manja je od gustoće zraka.	1 BOD
11.2.	pH >7 ili lužnata	1 BOD
11.3.	$2 \text{KI} + \text{Cl}_2 \rightarrow 2 \text{KCl} + \text{I}_2$ $2 \text{I}^- + \text{Cl}_2 \rightarrow \text{I}_2 + 2 \text{Cl}^-$	1 BOD
11.4.	$2 \text{NaCl}(\text{aq}) + 2 \text{H}_2\text{O}(\text{l}) \xrightarrow{\text{elektroliza}} \text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) + 2 \text{NaOH}(\text{aq})$	1 BOD
12.1.	aminokiselinama	1 BOD
12.2.	karboksilna skupina, amino-skupina, hidroksilna skupina	1 BOD
12.3.	biuret reakcija	1 BOD
12.4.	$\text{S}^{2-}(\text{aq}) + \text{Pb}^{2+}(\text{aq}) \rightarrow \text{PbS}(\text{s})$	1 BOD