

Tallinna XIII koolinoorte keemiaolümpiaadi koolivoor  
2012/ 2013 õ.a

Ülesannete lahendused\*

8. klass

1. (10)

a.  $m(\text{katseklaas}) = (210\text{cm}^3 - 200\text{cm}^3) \times 1 \frac{\text{g}}{\text{cm}^3} = 10,0\text{g}$  (1)

b.  $\rho(\text{katseklaas}) = \frac{10,0\text{g}}{204,5\text{cm}^3 - 200,0\text{cm}^3} \sim 2,2 \frac{\text{g}}{\text{cm}^3}$  (2)

c.  $\rho(\text{H}_2\text{SO}_4) = \frac{(211,5\text{cm}^3 - 210\text{cm}^3)}{1\text{cm}^3} \times 1 \frac{\text{g}}{\text{cm}^3} = 1,5 \frac{\text{g}}{\text{cm}^3}$  (1)

d.  $m(\text{H}_2\text{SO}_4) = 1\text{cm}^3 \times 1,5 \frac{\text{g}}{\text{cm}^3} = 1,5\text{g}$  (1)

e. kaitseprillid, ekraan, *очки, экран,* (0,5)  
kummikindad, *резиновые перчатки,* (0,5)  
kittel, *защитный халат,* (0,5)  
kraanivesi. *водопроводную воду* (0,5)

3%-line naatriumvesinikkarbonaadi lahus (söögisooda)

3-х процентный раствор гидрокарбоната натрия(пищевая сода) (0,5)

f.  $V(\text{vesi}) = \frac{1219,1\text{g} - \frac{1219,1\text{g} \times 30\%}{60\%}}{1 \frac{\text{g}}{\text{cm}^3}} \sim 609,6\text{cm}^3$

(2,5)  
10p

2. (10)

a. - K (1)

b. - H (1)

c. - D (1)

d. - L (1)

e. - G (1)

f. - N (1)

g. - O, P (1)

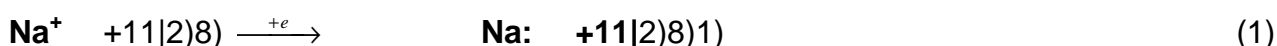
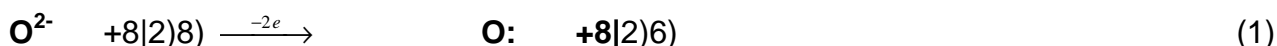
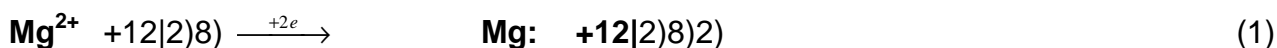
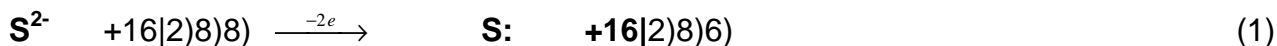
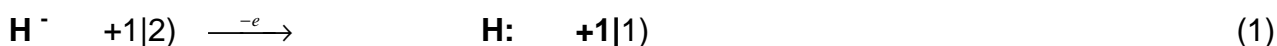
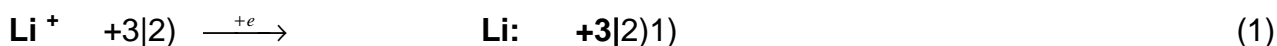
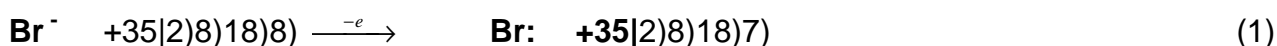
h. - Z (1)

i. (1)

R - P; (1)

S - O. (1)

10p

**3. (10)****a.****b.****i. MgO** (1)**ii. Põhjendus:**

neooni aatomi elektronkatte ehitus **Ne:** + 10|2)8) on samasugune kui magneesiumi iooni **Mg<sup>2+</sup>** : +12|2)8) ja hapniku iooni **O<sup>2-</sup>**: +8|2)8) elektronkatte ehitus.

(1)**10p****4. (10)**

$$\text{a. } m(\text{C}_{29}\text{H}_{34}\text{N}_2\text{O}_4) = \frac{10\text{cm}^3 \times 0,80 \frac{\text{g}}{\text{cm}^3}}{100\%} \times 1\% = \mathbf{0,08\text{g}} \quad (1)$$

$$\text{b. } \text{C}_{29}\text{H}_{34}\text{N}_2\text{O}_4 \quad (2)$$

$$\text{c. } M_r(\text{C}_{29}\text{H}_{34}\text{N}_2\text{O}_4) = \mathbf{474} \quad (2)$$

$$\text{d. } P(\text{O}) = \frac{16 \times 4}{474} \times 100\% \sim \mathbf{13,5\%} \quad (1)$$

$$\text{e. } P(\text{H})_{\text{vesi}} = \frac{2}{18} \times 100\% \sim \mathbf{11,11\%} \quad (1)$$

**f.**

$$m(\text{H}_2\text{O}) = 10\text{g} - \frac{10\text{g} \times 0,5\%}{100\%} = \mathbf{9,95\text{g}} \quad (1)$$

$$m(\text{C}_{29}\text{H}_{34}\text{N}_2\text{O}_4) = 10\text{g} - 9,95\text{g} = \mathbf{0,05\text{g}} \quad (1)$$

$$P(\text{O}) = \frac{\frac{16 \times 9,95\text{g}}{18} + \frac{0,05\text{g} \times 13,5\%}{100\%}}{10\text{g}} \times 100\% \sim \mathbf{88,5\%}$$

(1)**10p**

\* Keemiaolümpiaadi koolivooru komisjon võib iseseisvalt hinnata võimalikke alternatiivseid lahendusvariante.