

## Ülesannete lahendused\*

### 8. klass

#### Tallinna XIV koolinoorte keemiaolümpiaadi koolivoor

2013/ 2014 õ.a

#### 1. (10)

a. Prootonite arv **24**, neutronite arv **28**.

(1)

b. **A – kroom**

(0,5)

$$c. \quad 50\text{cm}^3 \times 2,85 \frac{\text{g}}{\text{cm}^3} + V\text{cm}^3 \times 0,866 \frac{\text{g}}{\text{cm}^3} = (50\text{cm}^3 + V\text{cm}^3) \times 2,65 \frac{\text{g}}{\text{cm}^3}$$

$$142,5 + 0,866V = 132,5 + 2,65V$$

$$10 = 1,784V, \quad \mathbf{V = 5,60\text{cm}^3}$$

(2)

$$d. \quad P = \frac{5,6\text{cm}^3 \times 0,866 \frac{\text{g}}{\text{cm}^3}}{50,0\text{cm}^3 \times 2,85 \frac{\text{g}}{\text{cm}^3} + 5,6\text{cm}^3 \times 0,866 \frac{\text{g}}{\text{cm}^3}} \times 100\% \sim \mathbf{3,3\%}$$

(2)

$$e. \quad \rho(\text{segu}) = \frac{m(\text{segu})}{V(\text{segu})}; \quad \rho(\text{segu}) = \frac{147,35\text{g}}{55,60\text{cm}^3} = \mathbf{2,65 \frac{\text{g}}{\text{cm}^3}}$$

(1)

$$f. \quad m(\text{smaragd}) = 0,58\text{cm}^3 \times 2,71 \frac{\text{g}}{\text{cm}^3} \sim \mathbf{1,57\text{g}}$$

$$\rho(\text{berüllklaas}) = \frac{1,57\text{g}}{0,65\text{cm}^3} \sim \mathbf{2,42 \frac{\text{g}}{\text{cm}^3}}$$

(2)

g. naturaalne smaragd ( $\rho=2,71 \frac{\text{g}}{\text{cm}^3}$ ) – **upub**

sünteetiline smaragd ( $\rho=2,65 \frac{\text{g}}{\text{cm}^3}$ ) – **heljub**,

berüllklaasist kivike ( $\rho=2,42 \frac{\text{g}}{\text{cm}^3}$ ) – **ujub pinnal**

(1,5)

---

10p

#### 2. (10)

$$a. \quad 20\text{g} - 19,7\text{g} = \mathbf{0,3\text{g}}$$

(1)

$$b. \quad m(\text{CS}_{2(\text{aq})}) = \frac{20\text{g} \times 100\text{g}}{19,7\text{g}} \sim \mathbf{101,5\text{g}}$$

(1)

$$c. \quad m = 100\text{g} + 100\text{g} + 19,7\text{g} = \mathbf{219,7\text{g}}$$

(1)

$$d. \quad m(\text{CS}_2) = \frac{100\text{g} \times (100\text{g} - 0,3\text{g})}{119,7\text{g}} \sim \mathbf{83,3\text{g}}$$

(2)

$$e. \quad m(\text{I}_2) = \frac{19,7\text{g} \times 100\text{g}}{119,7\text{g}} \sim \mathbf{16,5\text{g}}$$

(1)

$$f. \quad P(\text{I}_2) = \frac{16,5\text{g}}{100\text{g}} \times 100\% \sim \mathbf{16,5\%}$$

(1)

g. **tõeline;**

(1)

h. kolvid: **a-Wurtzi, b-Erlenmeyeri, c-seisukolb, d- mõõtekolb.**

(2)

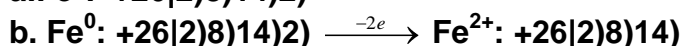
---

10p

#### 3. (10)

$$a. \quad \text{Fe}^0: \mathbf{+26(2)8)14)2}$$

(1)



(2)

- c.  $\text{Fe}^{2+}: +26|2)8)14) \xrightarrow{-e} \text{Fe}^{3+}: +26|2)8)13)$  (2)
- d.  $2\text{H}^+: +1| + \text{Fe}^0: +26|2)8)14)2) \rightarrow 2\text{H}^0: +1|1) + \text{Fe}^{2+}: +26|2)8)14)$  (2)
- e.  $2\text{Fe}^{2+}: +26|2)8)14) + \text{O}^0: +8|2)6) \rightarrow 2\text{Fe}^{3+}: +26|2)8)13) + \text{O}^{2-}: +8|2)8)$  (2)
- f.
- A - Fe (0,2)
- B -  $\text{Fe}^{2+}$  (0,2)
- C -  $\text{Fe}^{3+}$  (0,2)
- D -  $\text{H}^+$  (0,2)
- E - O (0,2)

10p

4. (10)

- a.  $4\text{P}+5\text{O}_2=\text{P}_4\text{O}_{10}$  (3)
- b.  $6\text{Li}+\text{N}_2=2\text{Li}_3\text{N}$  (2)
- c.  $10\text{KClO}_3+12\text{P}=10\text{KCl}+3\text{P}_4\text{O}_{10}$  (3)
- d.  $2\text{HgO}=2\text{Hg}+\text{O}_2$  (1)
- e.  $2\text{H}_2+\text{O}_2=2\text{H}_2\text{O}$  (1)

10p

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