

Rešenja zadataka – Priprema za test

1. Zaokruživanje brojeva

(2,26±0,02)

(60±10)

(7000±300)

(90±20)

(1877±3)

2. Pretvaranje jedinica

$$\frac{m}{s^2} = \frac{10^{-3} km}{10^6 ms^2} = 10^{-9} \frac{km}{ms^2}$$

$$\frac{mol}{dm^3} = \frac{10^3 mmol}{10^{-3} m^3} = 10^6 \frac{mmol}{m^3}$$

$$\frac{J}{molK} = \frac{10^{-3} kJ}{mol \cdot 10^3 mK} = 10^{-6} \frac{kJ}{molmK}$$

$$\frac{J}{molK} = \frac{10^3 mJ}{10^{-3} kmol \cdot 10^9 nK} = 10^{-3} \frac{mJ}{kmol nK}$$

$$\frac{Pa}{m} = \frac{1}{101325 \cdot 10^{-3} km} \frac{atm}{km} = 0,00986 \frac{atm}{km}$$

3. Apsolutna greška

$$\Delta m = \frac{m \cdot \delta_m}{100 \%} = \frac{2,436 g \cdot 6 \%}{100 \%} = 0,146 g \approx 0,2 g$$

$$m = (2,4 \pm 0,2)g$$

$$\Delta t = \frac{t \cdot \delta_t}{100 \%} = \frac{3,469 g \cdot 2 \%}{100 \%} = 0,069 g \approx 0,07 g$$

$$m = (3,47 \pm 0,07)g$$

4. Izvođenje izraza za grešku

$$\Delta y = \left| \frac{18}{z} + \frac{z}{2} \right| \Delta x + \left| \frac{18x}{z^2} + 26z + \frac{x}{2} \right| \Delta z$$

$$\Delta y = \left| \frac{2}{2\sqrt{x}} + 9x^2 \sin z \right| \Delta x + |3x^3 \cos z| \Delta z$$

$$\Delta y = \left| 1/x + \frac{14}{z} \right| \Delta x + \left| e^z + \frac{14x}{z^2} \right| \Delta z$$

5. Izračunavanje koncentracije

$$m = (13,75 \pm 0,01)g$$

$$V = (50,00 \pm 0,06) L$$

$$c = \frac{m}{V} = \frac{13,75 g}{50,00 L} = 0,275 g/L$$

$$\Delta c = \frac{\Delta m}{V} + \frac{m\Delta V}{V^2} = \frac{0,01 g}{50,00 L} + \frac{13,75 g \cdot 0,06 L}{(50,00 L)^2} = 0,00053 \frac{g}{L} \approx 0,00006 \frac{g}{L}$$

$$c = (0,2750 \pm 0,0006) \frac{g}{L}$$

6. Izračunavanje koncentracije

$$m = (14,36 \pm 0,01) g$$

$$V = (100,00 \pm 0,05) L$$

$$M(\text{NaCl}) = A(\text{Na}) + A(\text{Cl}) = 22,99 \frac{g}{mol} + 35,45 \frac{g}{mol} = 58,44 \frac{g}{mol}$$

$$\Delta M(\text{NaCl}) = \Delta A(\text{Na}) + \Delta A(\text{Cl}) = 0,01 \frac{g}{mol} + 0,01 \frac{g}{mol} = 0,02 \frac{g}{mol}$$

$$c = \frac{m}{MV} = \frac{14,36 g}{58,44 \frac{g}{mol} \cdot 100 L} = 0,0024572 \frac{mol}{L}$$

$$\begin{aligned} \Delta c &= \frac{\Delta m}{MV} + \frac{m\Delta M}{M^2V} + \frac{m\Delta V}{MV^2} = \frac{0,01 g}{58,44 \frac{g}{mol} \cdot 100 L} + \frac{14,36 g \cdot 0,02 \frac{g}{mol}}{\left(58,44 \frac{g}{mol}\right)^2 \cdot 100 L} + \frac{14,36 g \cdot 0,05 \frac{g}{mol}}{58,44 \frac{g}{mol} \cdot (100 L)^2} \\ &= 0,00000378 \frac{mol}{L} \approx 0,000004 \frac{mol}{L} \end{aligned}$$

$$c = (0,002457 \pm 0,000004) \frac{mol}{L}$$

7. Izračunavanje masenog udela

$$m_{\text{NaOH}} = (16,08 \pm 0,02) g$$

$$m_{\text{rastvarač}} = (156,36 \pm 0,01) g$$

$$m_{\text{rastvora}} = m_{\text{NaOH}} + m_{\text{rastvarač}} = 172,44 g$$

$$\Delta m_{\text{rastvora}} = \Delta m_{\text{NaOH}} + \Delta m_{\text{rastvarač}} = 0,03 g$$

$$w = \frac{m_{\text{NaOH}}}{m_{\text{rastvora}}} = 0,0932498$$

$$\Delta w = \frac{\Delta m_{\text{NaOH}}}{m_{\text{rastvora}}} + \frac{m_{\text{NaOH}} \Delta m_{\text{NaOH}}}{(m_{\text{rastvora}})^2} = \frac{0,02 g}{172,44 g} + \frac{16,08 g \cdot 0,03 g}{(172,44 g)^2} = 0,00013 \approx 0,0002$$

$$w = (0,0932 \pm 0,0002)$$

8. Izračunavanje pritiska

$$n = (2,01 \pm 0,06) mol$$

$$T = (302 \pm 1) K$$

$$a = (12,3 \pm 0,1) m$$

$$V = a^3 = 1860,867 m^3$$

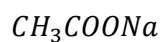
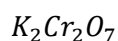
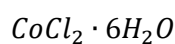
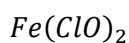
$$\Delta V = 3a^2 \Delta a = 45,387 m^3$$

$$p = \frac{nRT}{V} = \frac{2,01 mol \cdot 8,314 \frac{J}{molK} \cdot 302 K}{1860,867 m^3} = 2,712 Pa$$

$$\Delta p = \frac{\Delta nRT}{V} + \frac{nR\Delta T}{V} + \frac{nRT\Delta V}{V^2} = 0,156 Pa \approx 0,2 Pa$$

$$p = (2,7 \pm 0,2) Pa$$

9. Pisanje formula



10. Pisanje naziva jedinjenja

bakar(II) – fosfat

fero – oksid

litijum – bromid

barijum – acetat

perhlorna kiselina

rubidijum – hidrid

kobalt(II) – bromid

arsen(III) – oksid

kalijum – dihidrogenfosfat

fero – hlorid – tetrahidrat