

Differences between first and second editions of Preparatory Problems for IChO 2020

Problem 7. Data of ^1H NMR were deleted. Nevertheless, this correction cannot affect the solution of the problem.

Differences between second and third editions of Preparatory Problems for IChO 2020

Problem 1.7. Solution was corrected.

Problem 5. The structure of **J** (in 5.4) was added in the answer.

Problem 13.4. ffc was corrected as fcc.

Problem 15. In Scheme, (Concentrate) was added under NaOH.

Problem 16. section *After adjusting pH of the solution to 6.0, 1.25 mL of 0.0030 M I₂ solution*

The sentence for 16.20 and 16.21 was modified below.

After adjusting pH of the solution to 6.0, 12.5 mL of 0.300 M I₂ solution

Problem 18. section *In this case, the ~~total~~ energy can be written as follows:*

The sentence was modified.

Problem 21. section *One of the common theoretical approaches to explain KIE is the primary KIE. In the primary KIE approach, ...*

The sentence was modified below.

In one of the common theoretical approaches to explain KIE,

Problem 22. The answer (in 22.5) was corrected.

$$[C] = 1.80 \text{ mol dm}^{-3}$$

Problem 24.3. Formula was corrected.

$$\varphi_{\text{AO-DNA}} - \varphi_{\text{AO}} = \Delta\varphi$$

Differences between third and fourth editions of Preparatory Problems for IChO 2020

Problem 1. Transformation of E to D in Scheme was modified. Hydrolysis of nitrile group as 1) H_2SO_4 (cat), EtOH; 2) H_3O^+ .

Problem 13. The following corrections were made in the section before 13.8.

$$\mu_{eff} = \sqrt{\frac{3kX_mT}{L\mu_0\chi\mu_B^2}} = 0.7977\sqrt{X_mT} \text{ and } 1\mu_B = \frac{eh}{4\pi m_e} = 9.27 \times 10^{-24} \text{ JT}^{-1}$$

Where k = Boltzmann constant; L = Avogadro number; μ_0 = vacuum permeability; T = temperature in Kelvin and X_m (molar magnetic susceptibility) is in $\text{cm}^3 \text{ mol}^{-1}$.

Problem 13.8. The solutions were corrected.

$$X_m = (5.500/0.7977)^2/298.15 = 0.159 \text{ cm}^3/\text{mol} \text{ for Mn}^{2+}$$

$$X_m = (3.138/0.7977)^2/298.15 = 0.052 \text{ cm}^3/\text{mol} \text{ for Ni}^{2+}$$

Magnetic susceptibility of 0.01 mol doped samples:

$$1.59 \times 10^{-3} \text{ cm}^3 \text{ for Mn}^{2+}$$

$$5.20 \times 10^{-4} \text{ cm}^3 \text{ for Ni}^{2+}$$

Problem 14.16. Structure of ormaplatin was corrected.

Problem 16. section “controlled oxidation of sulfur trioxide by MnO_2 ... was corrected.

Problem 16.16. Structure of H_2SO_4 was deleted in solution.

Problem 21.5. Sentence “It is assumed that entropy is constant.” was added.

Problem 21.9. k_D was corrected as 2.0×10^2 .

Problem 25.3. k in table was corrected as sec^{-1} .