

History of up-date

[version 2.4 to 2.5 at 8<sup>th</sup> June, 2021]

#### Revision

Problem 4: standard entropies of formation → standard entropy changes

Question 3-2 in Problem 20:

The standard Gibbs energy change for the water-splitting reaction is 237 kJ mol<sup>-1</sup>.

→ The standard Gibbs energy change for the splitting of 1 mole of water is 237 kJ.

[version 2.3 to 2.4 at 7<sup>th</sup> April, 2021]

#### Correction of wording

Problem 26: Facial chirality → Planar chirality.

#### Revision in Advanced Difficulty

Facial chirality → Chirality.

[version 2.2 to 2.3 at 29<sup>th</sup> March, 2021]

#### Corrections

Henderson–Hasselbalch equation in Equations was corrected.

Question 5 in Problem 12: The value of  $C_{C-A}$  was corrected (-106.0 mM → -105.0 mM).

[version 2.1 to 2.2 at 15<sup>th</sup> March, 2021]

#### Changes for the remote IChO

Date of IChO2021 in the cover page: 24<sup>th</sup> July → 25<sup>th</sup> July

Appendix part was added at the end of the the documents. Practical Tasks were moved to Appendix part, and the comment for this change was added as the Appendix to the Preface.

Only theoretical subjects were left in the Advanced Difficulty. The list of Advanced Skills was moved to the Notes. Experimental techniques that do not appear in the Practical Tasks in the IChO were removed.

#### Corrections

Question 1-2 in Problem 1: The definition of  $u$  was corrected.  $N_A$  was removed from the sentence of the question.

Resonance structures of benzene in Problem 8 was corrected.

Electron-delocalized structure of anthracene for Question 2 in Problem 8 was corrected.

Chemical structure of ethylammonium nitrate in Problem 9 was corrected.

Label for R<sup>2</sup>-CO-NHS in equation S1 in Problem 9 was corrected.

Problem 15: specific weight → density

Problem 19:  $\Delta H \rightarrow \Delta H^\circ$  and ' $\rightleftharpoons$ ' → ' $\rightleftharpoons$ '

Introduction for Question 8 in Problem 21: hydroxide → hydroxy

[version 2.0 to 2.1 at 15<sup>th</sup> February, 2021]

### Fixation of Typos

Question 6-3 in Problem 3:  $K_B P_A \ll 1 \rightarrow K_B P_B \ll 1$

Caption of Figure 1 in Problem 6: Potetinal → Potential

### Changes in Wording

Question 9 in Problem 5: calculate → estimate

pipet → pipette in Task 6.

### Addition

Question 2 in Problem 5: Here both  $N$  and  $n^*$  are integers.

### Aesthetic Changes

Change of indent/line-spacing in Constants, Problem 7 and Problem 14.

Minor improvement of Scheme in Problem 21.

Improvement of quality of Schemes in Problems 23 and 25.

Spacing between Figures in Problem 28.

Removal of pale shading on compounds in Tasks 4, 5 and 7.