Important Instructions for this Exam:

- This exam has **3 problems**.
- Before the start of the practical exam, the **READ** signal is given. You have **15 minutes** to read the exam booklet. You may only read during this time. **Do not write or use the calculator. Do not work on any problem or interact with any equipment.**
- You may begin working when the **START** signal is given. You have **5 hours** to complete the exam. You may complete the tasks in any order, but **note that P1 and P3 contain waiting times of 1 h and 20 min**, respectively.
- For questions requiring you to tick the correct box(es), **to change your initial answer, shade the check box completely and draw a new box next to it**. Tick the box corresponding to your intended answer.
- When necessary, **wash your glassware at your workspace** with distilled water from a wash bottle **into the liquid waste container.** The **sinks must not be used** for washing glassware.
- You **must follow the safety rules** given in the IChO regulations below. **Any safety rule violation can result in your dismissal from the laboratory and the nullification of your practical examination work.**

Safety Rules

Students must obey the following safety rules. Any student who fails to comply will leave the practical exam and may receive a score of zero for the practical exam.

- Do not eat or drink in the lab. Chewing gum is not allowed.
- Work only in the designated area. Keep your work area and the common work areas tidy.
- No unauthorised experiments are allowed. No modification of the experiments is allowed.
- Vials and screw capped bottles must be kept closed whenever possible.
- Do not pipette with your mouth. Always use a pipette filler bulb.
- Immediately inform your lab assistant about spills, broken glassware, or any accidents.
- All waste must be properly disposed to prevent contamination or injury. Discard the solutions in the containers with the correct labels. Inform your lab assistant when any of the containers are full.
- Contact lenses are prohibited in the laboratory. Students needing vision correction must wear glasses.

In the practical exam hall, students are required to wear:

- full length trousers or other clothing covering their whole legs
- closed-end shoes
- a lab coat
- safety goggles
- gloves when handling harmful or unknown solutions and substances
- tied back any long hair and/or beards.

Experiment

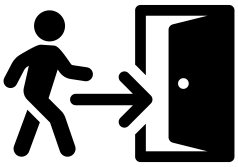
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G0-2

English (Official)

General Instructions

- All results and answers must be clearly written in pen **in their designed areas on the answer sheets**. Answers written outside the answer boxes will not be graded. Some figures are reproduced in your question sheets for draft work. They will not be graded. **Make sure to copy your final answer to your answer sheets**.
- **Write only** with the pen provided in the Answer Sheets. Do not use the permanent marker provided for your answers and do not write in pencil. The permanent marker is only for labelling lab equipment. **Use only** the calculator provided.
- **Write** relevant calculations where needed. Full marks will be given only for answers showing the correct work.
- The official English version is available upon request for clarification.
- Chemicals and labware, unless otherwise stated, will be refilled or replaced without penalty only once (one item). Each further replacement will result in the deduction of 1 point from your 40 practical exam points.
- You are not allowed to leave your working place without permission. If you need any assistance, **raise** the corresponding non-verbal communication card (see table below for meanings).
- **Keep** all items within the marked out area of your bench.
- The lab assistants will announce a **30-minute** notice before the **STOP** signal.
- You must stop your work immediately when the **STOP** signal is announced. Failure to stop working or writing can lead to nullification of your practical examination work.
- After the **STOP** signal, the lab assistant will come to sign your answer sheet.
- After both you and the lab assistant sign, place **all sheets with the cover sheet on top** back into the envelope. **Do not seal** the envelope.

		
I need a toilet break.	I need refill or replacement item, or have questions.	I need to grab a snack, or take a break.

Non-verbal communication cards.

GOOD LUCK!

Experiment

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G0-3

English (Official)

Problems and Grading Information

	Title	Question Pages	Answer Pages	Total Points	Percentage
1	Synthesise and Analyse	6	3	33	14
2	Atlas of Enzymes	6	3	108	11
3	The Adventures of Hodja Nasreddin	4	8	87	15
				Total	**40**

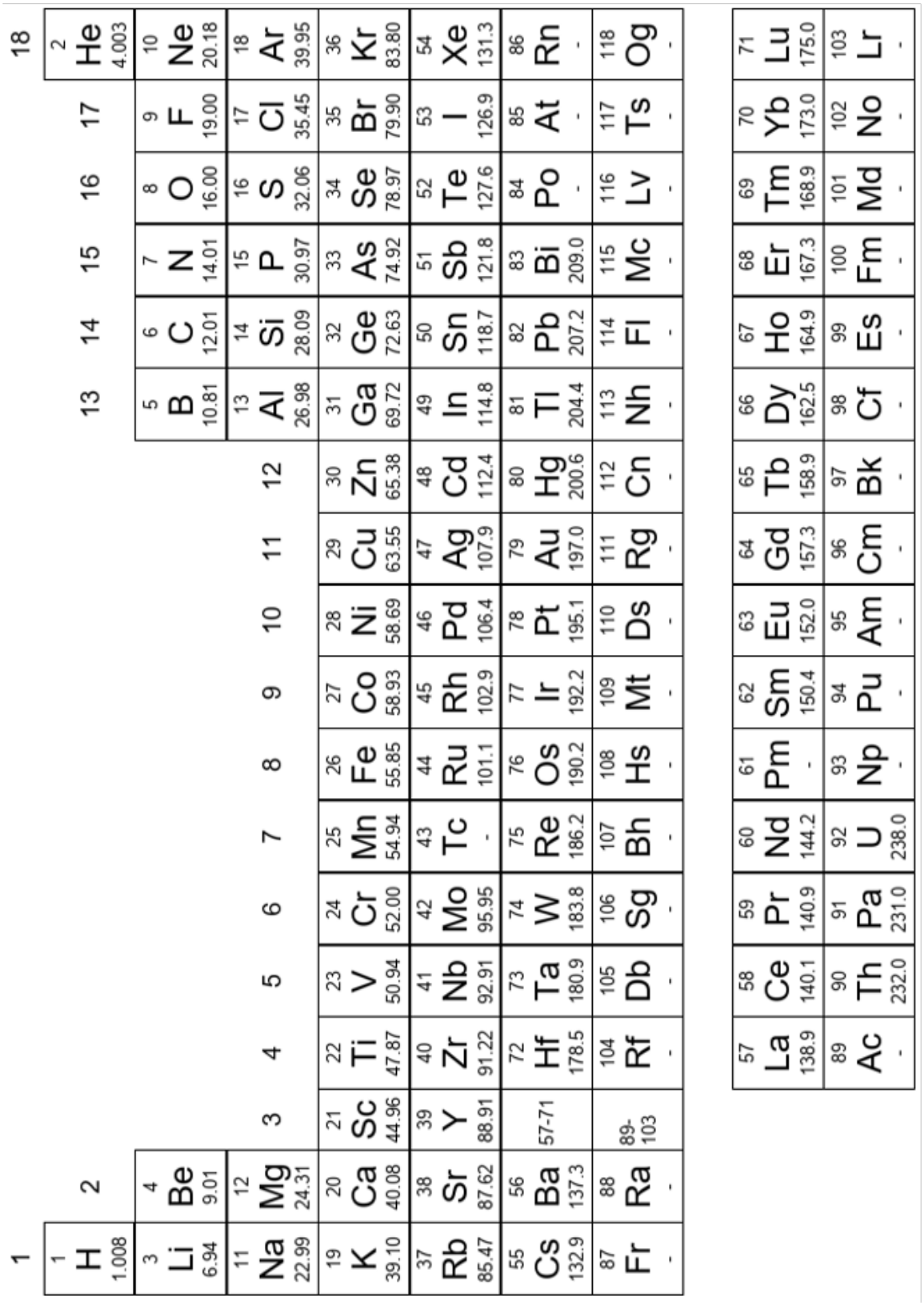
Experiment

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G0-4

English (Official)

Periodic Table of Elements



GHS Statements

Hazard Code	Hazard Statement
H225	Highly flammable liquid and vapour
H226	Flammable liquid and vapour
H272	May intensify fire; oxidiser
H290	May be corrosive to metals
H301	Toxic if swallowed
H302	Harmful if swallowed
H311	Toxic in contact with skin
H312	Harmful in contact with skin
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
H319	Causes serious eye irritation
H331	Toxic if inhaled
H332	Harmful if inhaled
H335	May cause respiratory irritation
H336	May cause drowsiness or dizziness
H341	Suspected of causing genetic defects
H351	Suspected of causing cancer
H361	Suspected of damaging fertility or the unborn child
H372	Causes damage to organs through prolonged or repeated exposure
H373	May cause damage to organs through prolonged or repeated exposure
H400	Very toxic to aquatic life
H402	Harmful to aquatic life
H410	Very toxic to aquatic life with long lasting effects
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

Chemicals:	
Ammonia buffer, pH 10	H314, H335, H412
Copper(II) sulfate solution	H319, H411
Dichloromethane	H351
Dithizone	H315, H319, H335
Eriochrome Black T indicator	H315, H319, H335, H411, H412
Ethanol	H225
Ethylenediaminetetraacetic acid disodium salt	H332, H373
Iron(III) nitrate solution	H314, H318
Hydrochloric acid	H314, H331
Pyridine in ethanol solution	H225, H302, H312, H332
Sliced red cabbage	no hazards
Sodium hydroxide	H314
Solution **Y1**	H302, H312, H315, H319, H332, H335
Solutions **E1**-**E5**	H301, H302, H311, H312, H314, H315, H318, H319, H331, H335, H341, H373, H400, H402, H410, H412
Solutions **M1**-**M3**	no hazards
Solutions **S1**-**S10**	no hazards
Solutions **W1**-**W7**	H302, H312, H315, H317, H318, H319, H332, H334, H341, H361, H372, H400, H410, H411
Solutions **X3**-**X6**	H226, H290, H302, H314, H318, H331
Unknown solution **R1**	H272, H302, H315, H318, H319, H335, H400, H410, H411
Unknown solution **R2**	H302, H312, H318, H319, H332, H400, H412
Unknown solvent	H225, H319, H336

Common Equipments and Chemicals

Equipment

Item	Quantity	Label
Shared on the table of common use:		
Nitrile gloves (S, M, L)	as needed	
Paper tissues refill	as needed	
Wash bottles with distilled water	as needed	
For each student:		
Safety goggles	1	
Hotplate stirrer	1	
Burette, 25.00 mL	2	
Laboratory stand with clamp and double burette clamp	1	
3-Valve Bulb	1	
Funnel for burette	2	
Permanent marker	1	
Ruler	1	
Pen	1	
Pack of paper tissues	1	
Container for disposal of liquid waste	1	**Liquid waste**
Container for disposal of solid waste	1	**Solid waste**

Chemicals

Name	State	Concentration	Quantity	Placed in	Label
For each student:					
Distilled water	l	-	500 mL	Wash bottle, 500 mL	**H_2O**
Sodium hydroxide	aq	0.0100 M	200 mL	Plastic bottle, 250 mL	**NaOH 0.01 M**