

Practical



55TH INTERNATIONAL
CHEMISTRY OLYMPIAD
SWITZERLAND 2023

A3-1

English (Official)

Beauty in simplicity

11% of total				
<u>Question</u>	<u>3.1</u>	<u>3.2</u>	<u>3.3</u>	<u>Total</u>
<u>Points</u>	<u>30</u>	<u>14</u>	<u>15</u>	<u>59</u>
<u>Score</u>				

3.1 (30 pt)

Perform the cross-reactions between solutions **S1–S6**. **Fill in** the table below with your observations using these symbols:

- "↓" for precipitation;
- "↑" for gas evolution;
- "S" for colour change of the solution;
- "–" if there are no visible observations.

Report the colours of the precipitates using the following letters:

- "W" for white/colorless;
- "B" for black;
- "C" for colored.

Solutions	S2	S3	S4	S5	S6
S1					
S2	X				
S3	X	X			
S4	X	X	X		
S5	X	X	X	X	

3.2 (14 pt)

Based on your observations and the hints given in the question sheet, **identify** the ions in **S1-S6** and **fill in** the table below.

Solution	Cation(s)	Anion(s)
S1		
S2		
S3		
S4		
S5		
S6		

3.3 (15 pt)

In the table below, **write** the ionic equations of the performed reactions that explain your observations. Use "↓" for precipitates and "↑" for gases.

Combination	Ionic Reaction Equation(s)
S1+S2	

3.3 (cont.)

Combination	Ionic Reaction Equation(s)
S1+S3	
S1+S4	
S1+S5	
S1+S6	
S2+S3	
S2+S4	
S2+S5	

3.3 (cont.)

Combination	Ionic Reaction Equation(s)
S2+S6	
S3+S4	
S3+S5	
S3+S6	
S4+S5	
S4+S6	
S5+S6	