

LIMITING AND EXCESS REACTANTS POGIL ANSWERS

LIMITING AND EXCESS REACTANTS POGIL ANSWERS IS A TOPIC THAT FREQUENTLY APPEARS IN CHEMISTRY CLASSROOMS AND ONLINE SEARCHES, HELPING STUDENTS UNDERSTAND THE CRUCIAL CONCEPTS BEHIND CHEMICAL REACTIONS AND STOICHIOMETRY. IN THIS COMPREHENSIVE ARTICLE, YOU WILL LEARN WHAT LIMITING AND EXCESS REACTANTS ARE, HOW TO IDENTIFY THEM, AND WHY THEY MATTER IN CHEMICAL EQUATIONS. THE ARTICLE BREAKS DOWN THE POGIL (PROCESS ORIENTED GUIDED INQUIRY LEARNING) APPROACH FOR MASTERING THESE CONCEPTS AND PROVIDES DETAILED EXPLANATIONS, STEP-BY-STEP STRATEGIES, AND PRACTICAL EXAMPLES. WHETHER YOU'RE SEEKING CLEAR SOLUTIONS FOR POGIL WORKSHEETS OR AIMING TO STRENGTHEN YOUR GRASP OF LIMITING AND EXCESS REACTANTS FOR EXAMS, THIS GUIDE COVERS EVERYTHING FROM FOUNDATIONAL DEFINITIONS TO ADVANCED PROBLEM-SOLVING TECHNIQUES. DISCOVER COMMON MISTAKES, KEY TERMINOLOGIES, AND BEST PRACTICES TO ENSURE ACCURACY IN YOUR ANSWERS. WITH A FOCUS ON PROVIDING DETAILED INSIGHTS AND RELIABLE INFORMATION, THIS RESOURCE IS DESIGNED FOR STUDENTS, EDUCATORS, AND ANYONE INTERESTED IN CHEMISTRY. CONTINUE READING TO UNCOVER ESSENTIAL STRATEGIES, PRACTICAL TIPS, AND EXPERT ANSWERS RELATED TO LIMITING AND EXCESS REACTANTS POGIL EXERCISES.

- UNDERSTANDING LIMITING AND EXCESS REACTANTS
- THE POGIL APPROACH TO CHEMISTRY LEARNING
- IDENTIFYING LIMITING AND EXCESS REACTANTS IN REACTIONS
- STEP-BY-STEP SOLUTIONS FOR POGIL WORKSHEETS
- COMMON MISTAKES AND MISCONCEPTIONS
- KEY TERMINOLOGIES AND DEFINITIONS
- PRACTICAL APPLICATIONS IN CHEMISTRY

UNDERSTANDING LIMITING AND EXCESS REACTANTS

DEFINITION OF LIMITING REACTANT

A LIMITING REACTANT IN A CHEMICAL REACTION IS THE SUBSTANCE THAT IS ENTIRELY CONSUMED FIRST, STOPPING THE REACTION FROM PROCEEDING FURTHER. THE LIMITING REACTANT DETERMINES THE MAXIMUM AMOUNT OF PRODUCT THAT CAN BE FORMED, AS THE REACTION CANNOT CONTINUE WITHOUT IT. RECOGNIZING THE LIMITING REACTANT IS A CRUCIAL SKILL FOR SOLVING STOICHIOMETRY PROBLEMS AND FOR ACCURATE EXPERIMENTAL CALCULATIONS IN CHEMISTRY.

DEFINITION OF EXCESS REACTANT

THE EXCESS REACTANT IS THE SUBSTANCE THAT REMAINS AFTER THE REACTION HAS COMPLETED. SINCE THE LIMITING REACTANT IS USED UP FIRST, THE EXCESS REACTANT IS PRESENT IN QUANTITIES GREATER THAN NEEDED FOR THE REACTION TO USE UP ALL OF THE LIMITING REACTANT. IDENTIFYING THE EXCESS REACTANT HELPS IN CALCULATING LEFTOVER MATERIALS AND OPTIMIZING CHEMICAL PROCESSES.

WHY LIMITING AND EXCESS REACTANTS MATTER

UNDERSTANDING LIMITING AND EXCESS REACTANTS IS ESSENTIAL FOR PREDICTING PRODUCT YIELDS, DESIGNING EFFICIENT CHEMICAL PROCESSES, AND MINIMIZING WASTE. MASTERY OF THESE CONCEPTS ALLOWS CHEMISTS TO SCALE REACTIONS,

MANAGE RESOURCES, AND TROUBLESHOOT LABORATORY PROCEDURES. IN ACADEMIC SETTINGS, THESE TOPICS FORM THE BASIS OF MANY CHEMISTRY EXAMS, WORKSHEETS, AND POGIL ACTIVITIES.

THE POGIL APPROACH TO CHEMISTRY LEARNING

WHAT IS POGIL?

POGIL (PROCESS ORIENTED GUIDED INQUIRY LEARNING) IS AN EDUCATIONAL METHODOLOGY THAT ENCOURAGES STUDENTS TO WORK COLLABORATIVELY TO DISCOVER CONCEPTS THROUGH GUIDED INQUIRY. IN THE CONTEXT OF CHEMISTRY, POGIL ACTIVITIES HELP LEARNERS ANALYZE REACTION SCENARIOS, ASK CRITICAL QUESTIONS, AND DEVELOP A DEEP UNDERSTANDING OF LIMITING AND EXCESS REACTANTS.

BENEFITS OF POGIL IN CHEMISTRY

- PROMOTES ACTIVE LEARNING AND ENGAGEMENT
- ENCOURAGES TEAMWORK AND COMMUNICATION
- ENHANCES PROBLEM-SOLVING AND CRITICAL THINKING SKILLS
- IMPROVES RETENTION OF KEY CONCEPTS, INCLUDING LIMITING AND EXCESS REACTANTS

POGIL WORKSHEETS FOR LIMITING AND EXCESS REACTANTS

POGIL WORKSHEETS TYPICALLY PRESENT STUDENTS WITH CHEMICAL REACTION SCENARIOS, TABLES OF REACTANT AMOUNTS, AND PROMPTS FOR ANALYSIS. THESE ACTIVITIES GUIDE LEARNERS THROUGH THE PROCESS OF IDENTIFYING WHICH REACTANT LIMITS THE REACTION AND WHICH IS LEFT IN EXCESS. ACCURATE ANSWERS REQUIRE A CLEAR UNDERSTANDING OF STOICHIOMETRIC RELATIONSHIPS AND BALANCED EQUATIONS.

IDENTIFYING LIMITING AND EXCESS REACTANTS IN REACTIONS

STEP 1: WRITE A BALANCED CHEMICAL EQUATION

TO DETERMINE THE LIMITING AND EXCESS REACTANTS, START BY WRITING A BALANCED CHEMICAL EQUATION FOR THE REACTION. BALANCING ENSURES THE CORRECT RATIO BETWEEN REACTANTS AND PRODUCTS, WHICH IS ESSENTIAL FOR ACCURATE STOICHIOMETRIC CALCULATIONS.

STEP 2: CONVERT AMOUNTS TO MOLES

CONVERT THE QUANTITIES OF EACH REACTANT TO MOLES USING THEIR MOLAR MASSES. MOLES PROVIDE A CONSISTENT BASIS FOR COMPARISON, AS CHEMICAL REACTIONS OCCUR ON A MOLECULAR LEVEL.

STEP 3: CALCULATE MOLE RATIOS

COMPARE THE MOLE RATIOS OF THE REACTANTS TO THEIR COEFFICIENTS IN THE BALANCED EQUATION. THIS STEP REVEALS

WHICH REACTANT WILL BE CONSUMED FIRST AND WHICH WILL REMAIN AFTER THE REACTION COMPLETES.

STEP 4: IDENTIFY LIMITING AND EXCESS REACTANTS

- THE REACTANT THAT PRODUCES THE SMALLEST AMOUNT OF PRODUCT IS THE LIMITING REACTANT.
- THE REACTANT THAT REMAINS AFTER THE LIMITING REACTANT IS USED UP IS THE EXCESS REACTANT.

STEP-BY-STEP SOLUTIONS FOR POGIL WORKSHEETS

TYPICAL WORKSHEET SCENARIO

A COMMON POGIL WORKSHEET MIGHT PRESENT A REACTION SUCH AS:

$2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$, WITH SPECIFIC AMOUNTS OF HYDROGEN AND OXYGEN GIVEN. STUDENTS ARE ASKED TO DETERMINE WHICH REACTANT IS LIMITING, WHICH IS IN EXCESS, AND HOW MUCH PRODUCT IS FORMED.

SOLVING THE WORKSHEET

1. BALANCE THE EQUATION: $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
2. CONVERT THE AMOUNTS OF H_2 AND O_2 TO MOLES
3. DETERMINE THE REQUIRED MOLE RATIO (2:1 FOR $\text{H}_2:\text{O}_2$)
4. CALCULATE HOW MUCH WATER CAN BE PRODUCED BY EACH REACTANT
5. IDENTIFY THE LIMITING REACTANT (THE ONE THAT PRODUCES LESS WATER)
6. CALCULATE THE AMOUNT OF EXCESS REACTANT LEFT OVER

POGIL ANSWERS EXPLAINED

POGIL ANSWERS MUST CLEARLY SHOW EACH CALCULATION STEP, USE PROPER UNITS, AND EXPLAIN THE REASONING BEHIND IDENTIFYING THE LIMITING AND EXCESS REACTANTS. ACCURATE ANSWERS REQUIRE ATTENTION TO DETAIL AND LOGICAL PROGRESSION FROM DATA TO CONCLUSION.

COMMON MISTAKES AND MISCONCEPTIONS

MISINTERPRETING MOLE RATIOS

STUDENTS OFTEN MISINTERPRET THE COEFFICIENTS IN CHEMICAL EQUATIONS, LEADING TO INCORRECT IDENTIFICATION OF THE LIMITING REACTANT. ALWAYS REFERENCE THE BALANCED EQUATION TO AVOID MISTAKES IN RATIO CALCULATIONS.

FORGETTING TO CONVERT TO MOLES

USING GRAMS OR OTHER UNITS INSTEAD OF CONVERTING TO MOLES CAN RESULT IN ERRORS. MOLES STANDARDIZE QUANTITIES FOR STOICHIOMETRIC CALCULATIONS AND SHOULD ALWAYS BE USED.

OVERLOOKING EXCESS REACTANT CALCULATIONS

- FAILING TO CALCULATE THE LEFTOVER AMOUNT OF EXCESS REACTANT
- NOT SHOWING ALL STEPS IN THE ANSWER PROCESS
- ASSUMING THAT BOTH REACTANTS ARE USED COMPLETELY

TIPS TO AVOID MISTAKES

DOUBLE-CHECK MOLE CONVERSIONS, VERIFY RATIOS AGAINST THE BALANCED EQUATION, AND ALWAYS COMPUTE THE REMAINING AMOUNT OF EXCESS REACTANT. CLEARLY DOCUMENT EACH STEP FOR FULL CREDIT IN POGIL WORKSHEETS.

KEY TERMINOLOGIES AND DEFINITIONS

STOICHIOMETRY

STOICHIOMETRY IS THE QUANTITATIVE RELATIONSHIP BETWEEN REACTANTS AND PRODUCTS IN A CHEMICAL REACTION, BASED ON BALANCED EQUATIONS. IT IS THE FOUNDATION FOR CALCULATING LIMITING AND EXCESS REACTANTS.

MOLE RATIO

A MOLE RATIO IS THE PROPORTION OF MOLES BETWEEN SUBSTANCES IN A REACTION, DICTATED BY THE COEFFICIENTS IN THE BALANCED EQUATION. IT IS USED TO COMPARE REACTANT QUANTITIES AND PREDICT PRODUCT YIELDS.

THEORETICAL YIELD

THEORETICAL YIELD IS THE MAXIMUM AMOUNT OF PRODUCT THAT CAN BE FORMED FROM THE LIMITING REACTANT, ASSUMING PERFECT CONDITIONS AND COMPLETE REACTION.

ACTUAL YIELD AND PERCENT YIELD

- ACTUAL YIELD: THE MEASURED AMOUNT OF PRODUCT OBTAINED FROM A REACTION
- PERCENT YIELD: THE RATIO OF ACTUAL YIELD TO THEORETICAL YIELD, EXPRESSED AS A PERCENTAGE

PRACTICAL APPLICATIONS IN CHEMISTRY

INDUSTRIAL REACTIONS

IN INDUSTRY, IDENTIFYING LIMITING AND EXCESS REACTANTS ENSURES EFFICIENT RESOURCE USE, MAXIMIZES PRODUCT OUTPUT, AND MINIMIZES WASTE. CHEMICAL ENGINEERS ROUTINELY APPLY THESE CONCEPTS WHEN SCALING UP REACTIONS FROM LAB TO PRODUCTION.

LABORATORY EXPERIMENTS

ACCURATE IDENTIFICATION OF LIMITING AND EXCESS REACTANTS IS VITAL FOR SUCCESSFUL LABORATORY EXPERIMENTS, OPTIMIZING REAGENT USE, AND INTERPRETING RESULTS. STUDENTS AND RESEARCHERS RELY ON THESE CALCULATIONS TO DESIGN EXPERIMENTS AND ANALYZE OUTCOMES.

ENVIRONMENTAL CHEMISTRY

- MINIMIZING EXCESS REACTANTS REDUCES POLLUTION AND CHEMICAL WASTE
- EFFICIENT REACTIONS CONTRIBUTE TO SUSTAINABLE PRACTICES

ACADEMIC ASSESSMENTS

LIMITING AND EXCESS REACTANT PROBLEMS FREQUENTLY APPEAR ON STANDARDIZED TESTS, QUIZZES, AND HOMEWORK ASSIGNMENTS. MASTERY OF THESE CONCEPTS IS ESSENTIAL FOR ACADEMIC SUCCESS IN CHEMISTRY COURSES.

TRENDING QUESTIONS AND ANSWERS ABOUT LIMITING AND EXCESS REACTANTS POGIL ANSWERS

Q: WHAT IS A LIMITING REACTANT IN A CHEMICAL REACTION?

A: THE LIMITING REACTANT IS THE SUBSTANCE THAT IS COMPLETELY CONSUMED FIRST IN A CHEMICAL REACTION, DETERMINING THE AMOUNT OF PRODUCT FORMED.

Q: HOW DO YOU IDENTIFY THE EXCESS REACTANT IN A POGIL WORKSHEET?

A: THE EXCESS REACTANT IS IDENTIFIED BY CALCULATING WHICH REACTANT REMAINS AFTER THE LIMITING REACTANT IS USED UP, BASED ON THE BALANCED CHEMICAL EQUATION AND MOLE RATIOS.

Q: WHY IS IT IMPORTANT TO CONVERT QUANTITIES TO MOLES WHEN SOLVING LIMITING AND EXCESS REACTANT PROBLEMS?

A: CONVERTING TO MOLES ENSURES ACCURATE COMPARISON BETWEEN REACTANTS, SINCE CHEMICAL REACTIONS OCCUR ON A MOLECULAR SCALE AND BALANCED EQUATIONS USE MOLE RATIOS.

Q: WHAT STEPS SHOULD YOU FOLLOW TO SOLVE A LIMITING AND EXCESS REACTANTS POGIL WORKSHEET?

A: BALANCE THE EQUATION, CONVERT REACTANT AMOUNTS TO MOLES, COMPARE MOLE RATIOS, DETERMINE WHICH REACTANT PRODUCES LESS PRODUCT, AND IDENTIFY LIMITING AND EXCESS REACTANTS.

Q: WHAT COMMON MISTAKES DO STUDENTS MAKE WHEN ANSWERING POGIL QUESTIONS ABOUT LIMITING REACTANTS?

A: ERRORS INCLUDE MISREADING MOLE RATIOS, NOT CONVERTING TO MOLES, SKIPPING STEPS, AND ASSUMING ALL REACTANTS ARE USED COMPLETELY.

Q: HOW DO STOICHIOMETRY AND LIMITING REACTANTS RELATE IN CHEMICAL CALCULATIONS?

A: STOICHIOMETRY USES BALANCED EQUATIONS AND MOLE RATIOS TO CALCULATE THE MAXIMUM PRODUCT YIELD, WHICH IS DETERMINED BY THE LIMITING REACTANT.

Q: WHAT IS THE ROLE OF THE EXCESS REACTANT IN A CHEMICAL REACTION?

A: THE EXCESS REACTANT IS LEFT OVER AFTER THE LIMITING REACTANT IS CONSUMED AND DOES NOT DETERMINE THE AMOUNT OF PRODUCT FORMED.

Q: CAN BOTH REACTANTS BE LIMITING IN A CHEMICAL REACTION?

A: NO, ONLY ONE REACTANT LIMITS THE REACTION; THE OTHER IS IN EXCESS.

Q: WHY DO POGIL ACTIVITIES USE COLLABORATIVE LEARNING FOR LIMITING AND EXCESS REACTANT PROBLEMS?

A: COLLABORATIVE LEARNING ENCOURAGES DISCUSSION, CRITICAL THINKING, AND DEEPER UNDERSTANDING OF COMPLEX CONCEPTS LIKE LIMITING AND EXCESS REACTANTS.

Q: HOW DOES IDENTIFYING LIMITING AND EXCESS REACTANTS BENEFIT INDUSTRIAL CHEMISTRY PROCESSES?

A: IT ENABLES EFFICIENT RESOURCE USE, MAXIMIZES PRODUCT YIELD, AND MINIMIZES WASTE, WHICH ARE CRITICAL FOR COST-EFFECTIVE AND SUSTAINABLE PRODUCTION.

Limiting And Excess Reactants Pogil Answers

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Limiting and Excess Reactants POGIL Answers: A Comprehensive Guide

Are you struggling with the concept of limiting and excess reactants in your chemistry class? Feeling overwhelmed by the POGIL activities designed to solidify your understanding? You're not alone! Many students find this topic challenging, but mastering it is crucial for success in chemistry. This comprehensive guide provides detailed explanations and answers to common POGIL activities on limiting and excess reactants, helping you confidently navigate this essential chemical concept. We'll break down the core principles, offer step-by-step solutions, and provide strategies to tackle similar problems in the future.

Understanding Limiting and Excess Reactants

Before diving into specific POGIL answers, let's solidify the fundamental concepts. A chemical reaction involves the rearrangement of atoms to form new substances. The reactants are the starting materials, and the products are the resulting substances. However, reactions don't always consume all reactants equally.

A limiting reactant is the reactant that is completely consumed first in a chemical reaction. It limits the amount of product that can be formed. Think of it as the ingredient that runs out first in a recipe – it determines how much of the dish you can make.

An excess reactant is the reactant that remains after the limiting reactant is completely used up. Some of this reactant will be left over once the reaction is complete.

Identifying the Limiting Reactant: A Step-by-Step Approach

Identifying the limiting reactant requires a systematic approach. Here's a breakdown of the process:

Step 1: Balanced Chemical Equation

Ensure you have a correctly balanced chemical equation. This is crucial for accurate stoichiometric calculations. A balanced equation ensures the law of conservation of mass is obeyed – the number of atoms of each element is the same on both sides of the equation.

Step 2: Moles of Reactants

Convert the given masses of reactants into moles using their respective molar masses. Remember,

moles are a fundamental unit in chemistry, providing a consistent way to compare quantities of substances.

Step 3: Mole Ratio

Use the stoichiometric coefficients from the balanced equation to determine the mole ratio of reactants. This ratio indicates the proportional amounts of reactants needed for complete reaction.

Step 4: Limiting Reactant Determination

Compare the mole ratio of the reactants to the actual mole ratio calculated in Step 2. The reactant that runs out first, based on this comparison, is the limiting reactant. This often involves a simple comparison – whichever reactant requires less of the other reactant to fully react is the limiting reactant.

Solving POGIL Activities: Example Problems

Let's illustrate this with a hypothetical POGIL problem:

Problem: Consider the reaction: $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$. If you have 4 moles of H_2 and 3 moles of O_2 , which is the limiting reactant?

Solution:

1. Balanced Equation: The equation is already balanced.
2. Moles: We have 4 moles of H_2 and 3 moles of O_2 .
3. Mole Ratio: From the balanced equation, the mole ratio of H_2 to O_2 is 2:1. This means 2 moles of H_2 react with 1 mole of O_2 .
4. Limiting Reactant:
If we use all 4 moles of H_2 , we would need 4 moles H_2 (1 mole O_2 / 2 moles H_2) = 2 moles of O_2 .
Since we have 3 moles of O_2 , we have enough O_2 .
If we use all 3 moles of O_2 , we would need 3 moles O_2 (2 moles H_2 / 1 mole O_2) = 6 moles of H_2 . We only have 4 moles of H_2 , so H_2 is the limiting reactant.

Therefore, H_2 is the limiting reactant.

Calculating Excess Reactant and Theoretical Yield

Once the limiting reactant is identified, you can calculate the amount of excess reactant remaining and the theoretical yield of the product.

Excess Reactant Calculation

Subtract the amount of excess reactant consumed (based on the stoichiometry and the limiting reactant) from the initial amount of excess reactant.

Theoretical Yield Calculation

The theoretical yield is the maximum amount of product that can be formed, based on the complete consumption of the limiting reactant. This calculation utilizes the stoichiometric ratios from the balanced equation.

Advanced POGIL Problems and Strategies

Some POGIL activities incorporate more complex scenarios, such as percentage yield calculations or reactions with multiple reactants. Remember to approach these systematically, breaking down the problem into smaller, manageable steps. Always double-check your units and stoichiometric calculations.

Conclusion

Mastering the concept of limiting and excess reactants is vital for success in chemistry. By understanding the fundamental principles and employing a systematic approach to problem-solving, you can confidently tackle even the most challenging POGIL activities. Remember to practice regularly and seek clarification whenever needed. Consistent effort will lead to a strong understanding of this important topic.

FAQs

1. What if the POGIL problem involves masses instead of moles? You'll first need to convert the given masses of reactants to moles using their molar masses before proceeding with the steps outlined above.
2. How do I calculate the percentage yield of a reaction? Percentage yield is calculated by dividing the actual yield (the amount of product obtained experimentally) by the theoretical yield (calculated as described above) and multiplying by 100%.
3. What if the chemical equation isn't balanced? Balancing the chemical equation is the first and most crucial step. An unbalanced equation will lead to incorrect calculations.

4. Can a reaction have more than one limiting reactant? No, a reaction will only have one limiting reactant. The limiting reactant is the one that is completely consumed first, restricting the amount of product formed.

5. Where can I find more practice problems? Your textbook, online resources, and additional chemistry workbooks provide ample opportunities for practice. Focus on understanding the underlying concepts rather than just memorizing solutions.

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monograph is to help teachers at universities, colleges and schools to diagnose and 'cure' the pre-concepts. In case of the school-made misconceptions it will help to prevent them from the very beginning through reflective teaching. The volume includes detailed descriptions of class-room experiments and structural models to cure and to prevent these misconceptions.

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research on the roles that people, processes, and institutions play in 2-and 4-year STEM degree production. This study pays special attention to the factors that influence students' decisions to enter, stay in, or leave STEM majors—quality of instruction, grading policies, course sequences, undergraduate learning environments, student supports, co-curricular activities, students' general academic preparedness and competence in science, family background, and governmental and institutional policies that affect STEM educational pathways. Because many students do not take the traditional 4-year path to a STEM undergraduate degree, *Barriers and Opportunities* describes several other common pathways and also reviews what happens to those who do not complete the journey to a degree. This book describes the major changes in student demographics; how students view, value, and utilize programs of higher education; and how institutions can adapt to support successful student outcomes. In doing so, *Barriers and Opportunities* questions whether definitions and characteristics of what constitutes success in STEM should change. As this book explores these issues, it identifies where further research is needed to build a system that works for all students who aspire to STEM degrees. The conclusions of this report lay out the steps that faculty, STEM departments, colleges and universities, professional societies, and others can take to improve STEM education for all students interested in a STEM degree.

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ranging from fundamental to applied chemistry, such as Arts and Chemistry Education, Biochemistry and Biotechnology, Chemical Education for Development, Chemistry at Secondary Level, Chemistry at Tertiary Level, Chemistry Teacher Education, Chemistry and Society, Chemistry Olympiad, Context Oriented Chemistry, ICT and Chemistry Education, Green Chemistry, Micro Scale Chemistry, Modern Technologies in Chemistry Education, Network for Chemistry and Chemical Engineering Education, Public Understanding of Chemistry, Research in Chemistry Education and Science Education at Elementary Level. We would like to thank those who submitted the full papers and the reviewers for their timely help in assessing the papers for publication. We would also like to pay a special tribute to all the sponsors of the 20 ICCE and, in particular, the Tertiary Education Commission (<http://tec.intnet.mu/>) and the Organisation for the Prohibition of Chemical Weapons (<http://www.opcw.org/>) for kindly agreeing to fund the publication of these proceedings.

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