

Signif Fig Rules & Examples

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You



basic concepts in chemistry.pdf
PDF

Lecture Notes on Significant Figure with examples from the pdf



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The lecture notes on significant figures from your provided PDF detail both the basic rules for determining significant figures in measurements and examples to illustrate these concepts. Here's a summary:

1. Definition and Importance:

- Significant figures in a measurement include all the digits that are known accurately, plus one last digit which is somewhat uncertain or estimated.
- They are crucial because they convey the precision of a measurement, informing how exact a measurement is.

2. Rules for Determining Significant Figures:

- All non-zero digits are considered significant. For example, 91 has two significant figures.
- Zeros between non-zero digits are significant (e.g., 202 has three significant figures).
- Leading zeros are not significant (e.g., 0.02 has one significant figure).
- Trailing zeros in a number with a decimal point are significant (e.g., 9.00 has three significant figures).

3. Examples:

- For the number 0.045, the significant figures are two—namely, '4' and '5' because the zeros preceding are not significant.
- For the number 2.500, there are four significant figures, with the trailing zero being significant due to the presence of a decimal point.

4. Operations with Significant Figures:

- When multiplying or dividing, the number of significant figures in the result is determined by the original number with the smallest count of significant figures.
- When adding or subtracting, the precision of the result is dictated by the number with the least number of decimal places.

These notes are summarized from the content available in the "Basic Concepts in Chemistry" PDF. These guidelines are essential for ensuring measurements and calculations are reported accurately in scientific

work.



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Example problems in Significant figure additions, subtraction, multiplication, and division. Refere pdf.



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Here are example problems from your PDF that illustrate operations with significant figures in addition, subtraction, multiplication, and division:

1. Addition:

- **Problem:** Add 12.11 and 18.0.
- **Solution:** The result, 30.11, should be rounded to 31.1 because 18.0 only has one digit after the decimal point .

2. Subtraction:

- **Problem:** Subtract 1.012 from 31.122.
- **Solution:** The result, 30.11, is rounded to 30.1 to match the least number of decimal places in the original numbers, which is 1 (from 1.012) .

3. Multiplication:

- **Problem:** Multiply 2.5 by 1.25.
- **Solution:** The result is 3.125, but it should be rounded to 3.1 because the number with the fewest significant figures (2.5) has two significant figures .

4. Division:

- **Problem:** Divide 4.8 by 2.4.
- **Solution:** The result is exactly 2, which has one significant figure since 2.4 has two significant figures .

These examples demonstrate the importance of matching the number of significant figures in the final result with the number of significant figures in the least precise measurement used in the calculation.



You

10 Problems based on Significant Madhumita 12C0605



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It seems like you're asking for problems related to significant figures specifically tailored for someone named "Madhumita" with the identification "12C0605." Since there's no specific content associated with

this name or ID in the documents, I will create 10 general problems involving significant figures that can be used for educational purposes.

Problems Based on Significant Figures:

1. **Addition:** Add 5.6783 and 2.1.
2. **Subtraction:** Subtract 0.004 from 3.210.
3. **Multiplication:** Multiply 3.65 by 2.1.
4. **Division:** Divide 22.0 by 7.
5. **Rounding:** Round 12.3456 to three significant figures.
6. **Addition with Three Numbers:** Add 1.01, 22.356 and 0.789.
7. **Subtraction and Multiplication:** Subtract 2.5 from 14.789 and then multiply by 0.25.
8. **Decimal Places:** Convert 0.00012345 to two significant figures.
9. **Complex Operation:** Multiply 5.556 by 0.002 and then add 0.789.
10. **Practical Application:** You have a length of 5.784 meters and you cut off a piece measuring 0.3345 meters. What is the length of the remaining piece, rounded to the nearest significant figure?

These problems require understanding how to handle significant figures during various mathematical operations and are typical exercises to enhance understanding in a chemistry or physics context.



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key



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It seems like you are looking for a "key" or solutions to the significant figures problems provided. Here are the solutions to the 10 problems:

Solutions to Problems Based on Significant Figures:

1. **Addition:** $5.6783 + 2.1 = 7.7783$ should be rounded to 7.8 (since 2.1 has two significant figures).
2. **Subtraction:** $3.210 - 0.004 = 3.206$ should be rounded to 3.21 (since 0.004 has one significant figure).
3. **Multiplication:** $3.65 \times 2.1 = 7.665$ should be rounded to 7.7 (since 2.1 has two significant figures).
4. **Division:** $22.0 \div 7 = 3.142857$ should be rounded to 3.14 (since 22.0 has three significant figures).
5. **Rounding:** 12.3456 rounded to three significant figures is 12.3.
6. **Addition with Three Numbers:** $1.01 + 22.356 + 0.789 = 24.155$ should be rounded to 24.2 (since 1.01 has three significant figures).
7. **Subtraction and Multiplication:** $(14.789 - 2.5) \times 0.25 = 3.07225$ should be rounded to 3.07 (since 2.5 has two significant figures).
8. **Decimal Places:** 0.00012345 to two significant figures is 0.000123.
9. **Complex Operation:** $(5.556 \times 0.002) + 0.789 = 0.790112$ should be rounded to 0.79 (since 0.002 has one significant figure).
10. **Practical Application:** $5.784 - 0.3345 = 5.4495$ should be rounded to 5.45 (since 0.3345 has four significant figures).

Each problem here demonstrates the application of rules for significant figures in different types of calculations, ensuring the final answers reflect the precision allowed by the least precise number used in

the calculations.