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**LAB 5 EXPERIMENT**

# THE EFFECT OF DILUTION ON THE COLOUR OF A SOLUTION

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## Goal

Determine the effect of dilution on the colour of a solution.

**1.** What is the independent variable in this lab?

_____

**2.** What is the dependent variable in this lab?

_____

## Hypothesis

I think that _____

because _____.

## Materials

- marker
- 4 test tubes (18 mm × 150 mm) and stoppers (No. 1)
- test-tube rack
- 50-mL graduated cylinder
- container of given solution with 10 g/L concentration
- 25-mL graduated cylinder
- wash bottle of distilled water

## Procedure

***1.*** Number the test tubes from 1 to 4 with the marker.
***2.*** Measure into the 50-mL graduated cylinder 50 mL of the given solution (concentration of 10 g/L).
***3.*** Pour the solution into test tube 1 and record the volume.
***4.*** Measure into the 25-mL graduated cylinder 10 mL of the given solution.
***5.*** Pour the solution into test tube 2 and record the volume.
***6.*** Measure into the 50-mL graduated cylinder 40 mL of distilled water.
***7.*** Pour the water into test tube 2 and record the volume of solvent added.
***8.*** Stopper test tube 2 and shake to mix the solution.
***9.*** Calculate the concentration of solution in test tube 2.
***10.*** Prepare a solution in test tube 3 of a different total volume and the same concentration as the solution in test tube 2. Write down your calculations.

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***11.*** Prepare a solution in test tube 4 of a different volume of distilled water and the same volume of given solution as in test tube 2. Write down your calculations.

***12.*** Compare the colour of the four solutions and record your results.

***13.*** Clean up and put away materials.

## Results

Record your results in the table below. Give the table a title.

**Title:**

| Test tube | Volume of given solution (mL) | Volume of water added (mL) | Total volume of prepared solution (mL) | Concentration of prepared solution (g/mL) | Colour of prepared solution |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

## Calculations

Write down your calculations below.

Calculation of concentration or volume of prepared solutions

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## Analysis of the results

**1.** Does the colour of a solution of the same final concentration change according to volume? Explain your answer.

**2.** What happens to the colour of a solution when distilled water is added?

**3.** How is the concentration of a solution affected by the adding of distilled water?

**4.** What are the possible sources of error in this lab?

**5.** How could you improve the protocol for this lab?

## Conclusion

**1.** Complete the following sentence:

When a solution is diluted, concentration _____.

**2.** Was your hypothesis confirmed or not? Explain your answer.

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## Application

To prepare fruit juice from a concentrate of 250 mL, you need to pour the concentrate into a large container, then add four times the volume of water and mix well. How would you prepare a glass of fruit juice (250 mL) of the same concentration?

_____

_____