Review: Liquid Layers

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Problem 2: Liquid layers

Water and vegetable oil do not mix and form two layers in a beaker. It is possible to fill the beaker with many more **layers of immiscible fluids. How many layers** can you obtain? Investigate the **motion of the interfaces** if the beaker is **disturbed or shaken**.

Partially fulfilled

Overview

- Theory
- Experiment
- Results
- Agreement between theory and experiment
- Conclusions

Green = very good
Yellow = average
Red = needs improvement

Reporter

1. Definition of main parameters (immiscible fluids, density and polarity)
2. Theoretical explanation as to why different polarity layers remain separated

1. Lack of experimental method
2. Did not have a hypothesis and sources of error
3. Did not account for surface tension as a reason for separation of the layers
4. Differentiating between layers only due to polarity, density differences not observed
5. Insufficient number of liquid layers obtained
6. Only one method for disturbing the tower shown
7. Non-uniform force applied for stirring the mixture
8. Didn’t show any experimental setup.
9. Lack of quantitative investigation.
10. No clear conclusions
11. **Poor explanation on amount of layers obtained - claimed to be infinite**
12. Claimed a layer can’t evaporate from the tower

Opponent

1. Asked important questions such as the method of shaking of the tower
2. Highlighted the importance of constant mixing and not uncontrolled one
3. Suggested methods that reporter hadn’t mentioned

1. Didn’t prioritise the questions
2. Didn’t focus on the experiment but on theoretical questions
3. Didn’t address all missing points in the report
4. Addressed experimental setup, which was missing in reporter’s presentation
5. Claims that the used substances were enough.
6. The hydrogen bond is not relevant.

Discussion

1. The optimal height of the tower was discussed.
2. The motion of the shaked beaker
3. Repetition of the experiment

1. Unclear answers of the reporter
2. The questions weren’t prioritised.
3. Opponent asked clarifying questions in the discussion (method of inserting the fluids)
4. There is a difference between the used methods of disturbing since it will probably produce different results.

Missed points

- Establishing more different methods to test the stability of the tower
- Investigating the evolution of the tower for prolonged period of time (months)

Quantitative measuring of the mixing of the layers.

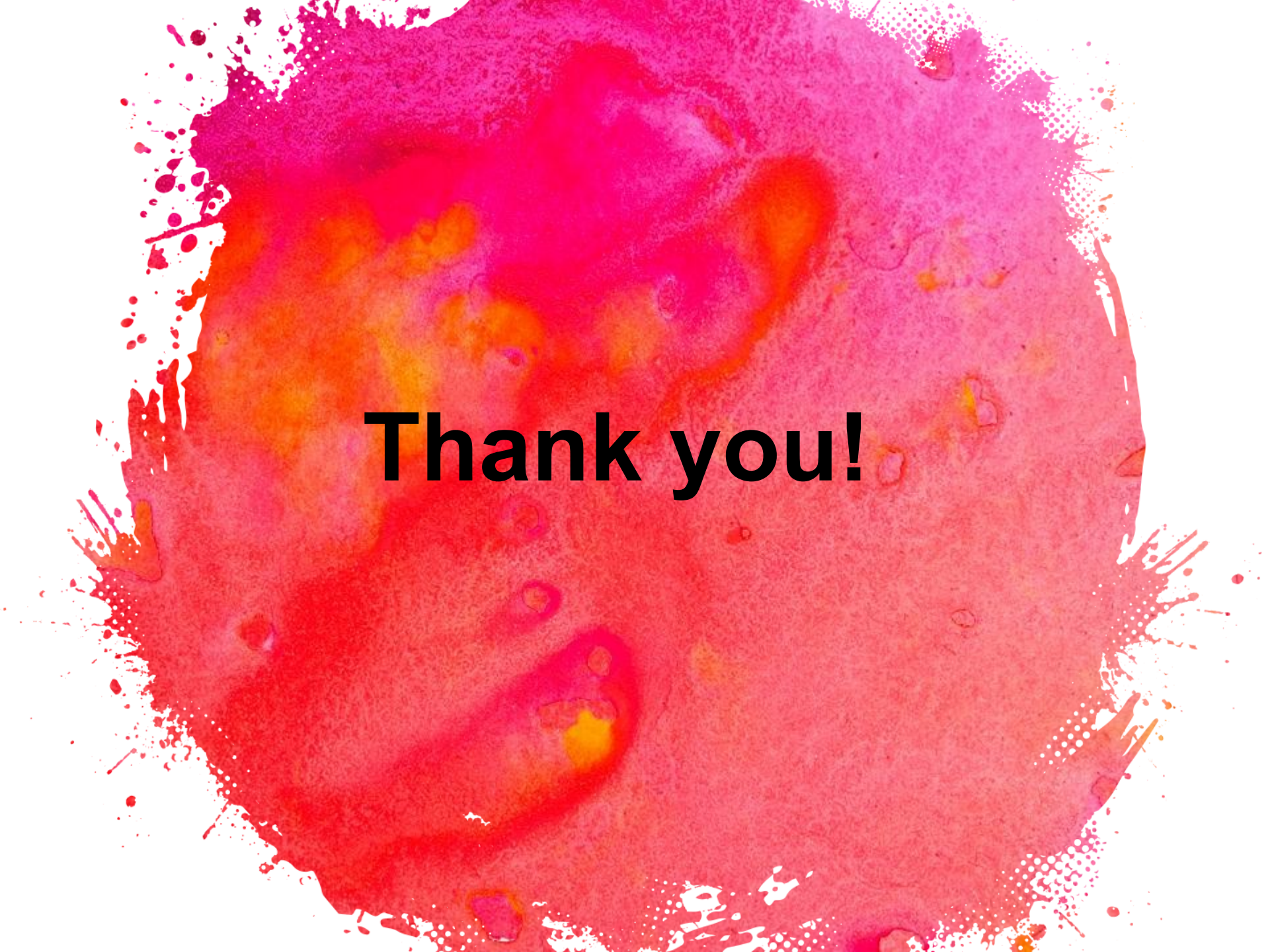
Sources of error

Clash

Point of discussion: The motion of the beaker

Reporter: Claimed no difference between shaking and disturbing.

Opponent: Claims there is a difference between shaking and disturbing the tube.



Thank you!