

# MCEN 4151: Flow Visualization

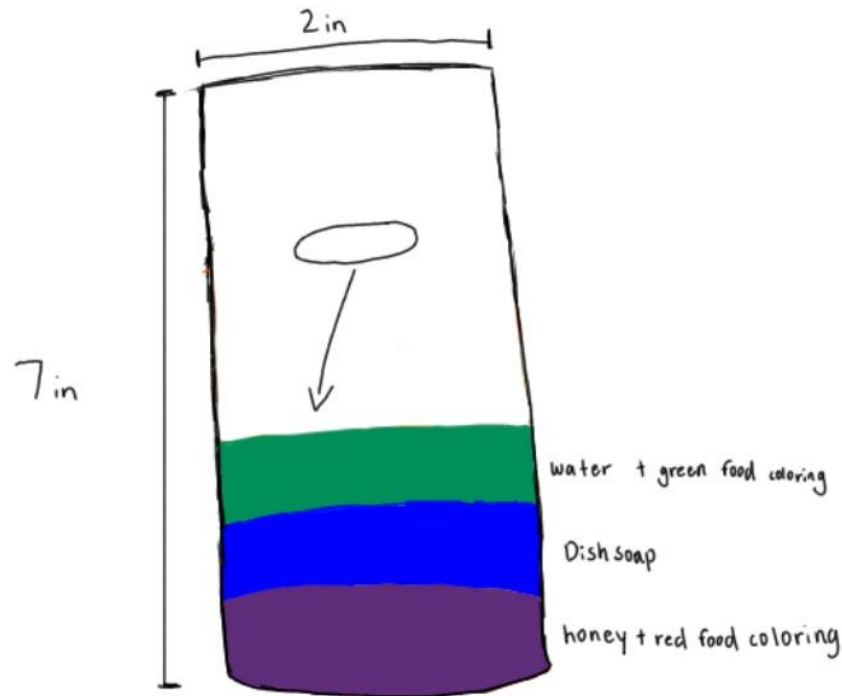
## Section 001

### Image-Video 02 Report

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The image-video two assignment allowed us to dive into the flow-visualization world and experiment capturing different phenomena. The experiment being run is a mixture of super viscous fluid mixed with an ALKA-SELTZER being dropped down the side of a clear container. Once the tab falls into the clear container, it experiences effervescent. The intent of this experiment was to capture how having a high viscosity distorts an effervescent reaction



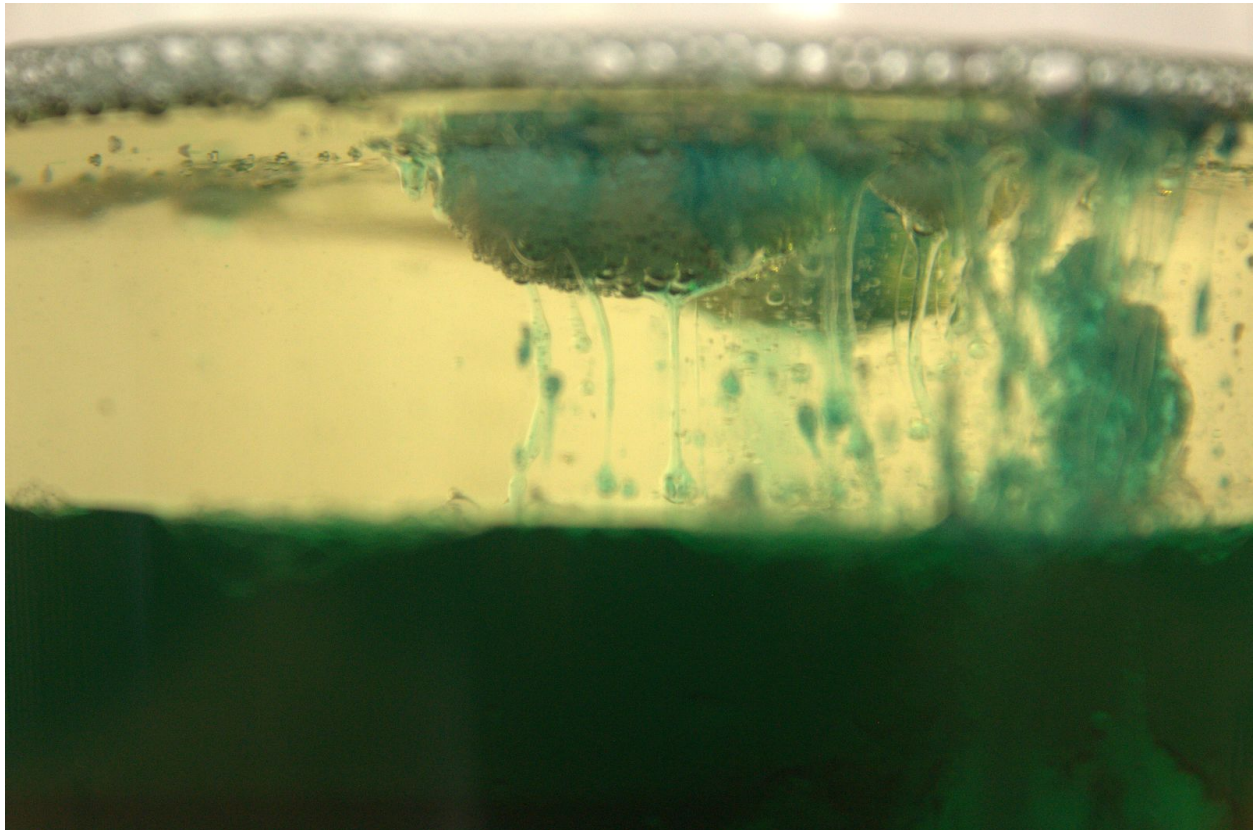
**Figure 1: Fluid Apparatus sketch**

The flow apparatus is a clear small diameter container that is a mixture of several fluids and food colors. This effervescent experiment is a flow over a submerged obstacle with bubbles caused by an effervescent reaction. What is going on is that the effervescent tablet is being dissolved and emitting carbon dioxide causing bubbles and fizzy-ness. To recreate this experiment is rather similar because I used a 2 inch diameter cylindrical container that housed all the fluids, I would highly recommend a couple of minutes for all the fluids to be in static equilibrium and then drop the effervescent tablet to see the reaction.

The technique was very hassle free as preparation did not take a lot off time, the most important was getting the right fluids and correctly pouring it down the side (at an angle) to prevent any

mixture. What an individual would need to recreate this experiment is half cup of blue soap, half cup of any cooking oil, half cup of both rubbing alcohol and corn syrup. In between each pour, mix in your choice of food coloring for aesthetic reasons.

At first, the photo had a large field of view, I decided to crop it for aesthetic reasons and having too much view turned my attention to the bubbles and that is what I was aiming for. The distance from the object to the lens was very close, within inches. It was challenging to get a good focus at such a short distance but lowering the ISO to 800 and using manual focus helped. The image was captured using a canon camera, with a lens of width of 55mm the original image had a size of 5184x3456 pixel. I used darktable to add sharpening and a black saturation tint to the image using a filter. The camera had a shutter speed of 1/80 with a f stop of f/5.6.



*Figure 2: Unedited original photo*

This image reveals how viscosity affects effervescent . The higher the viscosity, the longer the effervescent bubbles last and stretch. One thing I would like to improve upon was the lighting, to do that I will re-do this experiment with a dark background with a LED on top. This image tells the story of a effervescent tab dissolving in multiple fluids that each have a high viscosity. In the future I would like to change the camera FOV to experiment to get a wider view of the effervescent reaction.

**References**

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2. Education.com. (2013, June 14). Rainbow in a Jar: Science project. Retrieved October 13, 2020, from <https://www.education.com/science-fair/article/rainbow-in-a-jar/>
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