



**VROC® initium Service Note:** Evaporative sample loss using standard vials and caps is not substantial and is unlikely to affect viscosity measurements during overnight measurements.

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A common concern of initium users is a potential change in sample viscosity prior to measurement due to evaporative loss after sample preparation and prior to measurement. To quantify evaporative loss and its potential effects, samples of distilled water were prepared and stored in standard vials, inserts, and cross-cut caps. Their changes in mass were measured after 1 and 5 days. Evaporative loss was found to be minimal, approximately 0.0057  $\mu\text{L}/\text{hour}$  or 0.1368  $\mu\text{L}/\text{day}$  on average. For a 26- $\mu\text{L}$  small-volume sample, this would be equivalent to a volume change of 0.02 %/hour. Therefore, for a vast majority of aqueous samples, viscosity will not be significantly impacted by evaporative loss if samples are measured within 48 hours of preparation.

### Testing method

Five 100- $\mu\text{L}$  samples of distilled water were loaded into standard vials and inserts, then capped and weighed. Samples were stored in a vial rack and held at approximately 22 °C for the duration of the experiment. Sample vials were reweighed at 22.5 hours and 144.5 hours after initial loading and weighing. Water volume lost through evaporation was calculated from change in mass.

### Results

Evaporative loss was extremely low, approximately 0.0057  $\mu\text{L}/\text{hour}$  on average. The greatest volume lost for a particular sample was 1.3  $\mu\text{L}$  over 144.5 hours, or .0090  $\mu\text{L}/\text{hour}$ . Assuming a similar evaporation rate for a 26- $\mu\text{L}$  sample (given that the exposed surface area of the liquid in the insert would be the same between a 100- $\mu\text{L}$  and 26- $\mu\text{L}$  sample), the average rate of volume change would be 0.02 %/hour.

Sample #	Mass (g)		
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>
1	3.4988	3.4988	3.4986
2	3.5461	3.5456	3.545
3	3.54	3.5395	3.5387
4	3.5557	3.5556	3.555
5	3.517	3.5165	3.5163

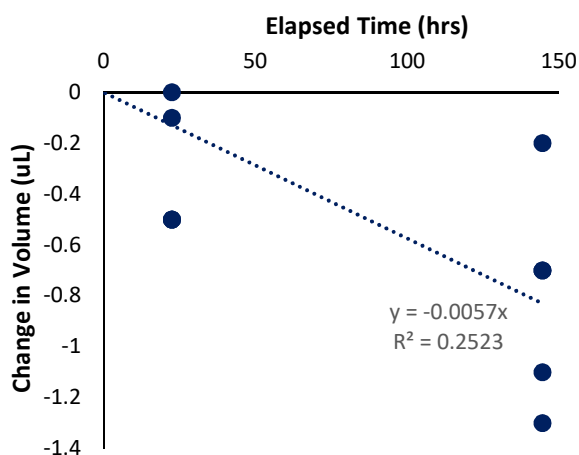
Distilled water, density = 1.0 g/mL

T<sub>0</sub> = 0 hours elapsed

T<sub>1</sub> = 22.5 hours elapsed

T<sub>2</sub> = 144.5 hours elapsed

Mass = Sample + Vial + Cap + Insert



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