Food test: Emulsions

**Objective**

To investigate the factors affecting the stability of oil and water emulsions

**Principles**

An emulsion contains droplets of one liquid dispersed in another, the two liquids being immiscible. For example, when oil and water are mixed vigorously, one of them will break up into droplets and disperse in the other. The dispersion won’t last long and the two liquids will separate with the oil forming a layer on top of the water. Emulsifiers are substances added to the emulsion to facilitate the dispersion of one phase (as small droplets) into another.

**Equipment & materials**

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| --- | --- |
| **Equipment** | **Materials** |
| 7 glass bottles  Measuring cylinder  Measuring spoons  Timer  Paper towel | 325mL canola oil  225mL vinegar  1tsp paprika  1tsp dry mustard  1tsp pepper  1tsp beaten egg yolk |

**Procedures**

1. Label seven glass bottles as sample 1 to 7.
2. Fill each glass bottle with the appropriate volume of vinegar and oil as indicated. Place the emulsifier to the designated bottles.
3. Cover each glass bottle with a lid and shake it vigorously for **30 seconds**.
4. Describe the appearance of emulsions after 1 minute.

**Results**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sample** | **Vinegar** | **Oil** | **Seasonings** | **Appearance after 1 minute** |
| 1 | 25ml | 50ml | --- |  |
| 2 | 50ml | 25ml | --- |  |
| 3 | 50ml | 50ml | --- |  |
| 4 | 25ml | 50ml | 1tsp paprika |  |
| 5 | 25ml | 50ml | 1tsp dry mustard |  |
| 6 | 25ml | 50ml | 1tsp pepper |  |
| 7 | 25ml | 50ml | 1tsp beaten egg yolk |  |

**Questions**

1. Based on your observations of separation time for sample 1, 2 and 3, which vinegar-oil ratios have the highest stability?
2. Based on your observations of separation time for sample 1, 4, 5, 6 and 7, which emulsifier would you recommend for making salad dressing?
3. Besides stability of emulsion, what are the reasons for adding paprika/dry mustard/ pepper/ egg yolk to the mixtures?