To Compare the Effectiveness Of a Number Of Emulsifying Agents In Forming Emulsions

Theory

Different emulsifying agents have different capacities for emulsifying a given oil. An emulsifying agent lowers the inter facial tension between water and oil and gets concentrated at the surface between two liquids. Due to the reduced inter facial tension, the tiny droplets of oil do not coalesce and thus the emulsions become stable. Since different emulsifying agents have different tendencies to lower the inter facial tensions, they have different capacities for emulsifying a given oil.

Apparatus

Five stoppered bottles, measuring cylinder, stop-watch or simple watch, 5 ml pipettes.

Materials Required

Castor oil, 1% solutions of sodium oleate, soap, detergent, gelatine and gum acacia.

Procedure

1. Take five stoppered bottles and wash them with water and label them as A, B, C, D and E.
2. Take 5 ml of castor-oil in each of five bottles, A, B, C, D and E.
3. Add 50 ml of distilled water to each bottle.
4. Add 5 drops of sodium oleate solution to bottle A, shake it vigorously for one minute and allow it to stand.
5. Note the time taken for the two layers to separate out.
6. Similarly, take tubes, B, C, D and E and add 5 drops of soap solution, detergent solution, gelatine solution and gum acacia solution respectively to them. Shake vigorously for one minute and observe the time taken for the two layers to separate out in each case. Record the observations.

Observations

Volume of castor oil taken in each tube = 5 ml
Volume of distilled water added = 5 ml

Bottle or Tube	*Emulsifier added*	*Volume of emulsifier added*	*Time taken for the separation of two layers*
A	1% Sodium oleate solution	5 drops	— *s*
B	1% Soap solution	5 drops	— *s*
C	1% Detergent solution	5 drops	— *s*
D	1% Gelatine	5 drops	— *s*
E	1% Gum acacia	5 drops	— *s*

Result

It is clear from the above observations that……..when added causes the emulsion to take the longest time to break and is rated 1 while……. when added causes the emulsion to take the minimum time to break and is rated 5. The effectiveness of the given emulsifying agents is in the following order ……..

Precautions

1. Add equal number of drops of soap solution to all the bottles.
2. Each bottle should be shaken vigorously and for same time. .
3. The time should be recorded carefully. Start the stopwatch immediately after shaking is stopped and stop it immediately when the two layers just separate.