

# EMULSIONS

- Colloidal dispersion of one liquid in another
- Two phases
- Continuous phase and dispersed phase
- Two immiscible liquids when mixed form emulsion
- Agitation needed to mix

## TYPES

- O/W: OIL IS DISPERSED IN WATER eg. mayonnaise and milk
- W/O: WATER DISPERSED IN OIL

eg: margarine/butter

## OTHER CLASSIFICATION

Temporary emulsion e.g. French Dressing (oil, vinegar)

Semi-permanent e.g. Milk

Permanent emulsion e.g. Mayonnaise/homogenised milk (small sized droplets)

## Theory of Emulsification

- Break and suspend big drop into small droplets
- Stabilize it
- Add emulsifiers to reduce interfacial surface tension between the molecules of the dispersed phase

- Emulsifiers coat the molecules of the dispersed phase thereby reducing the surface tension
- In mayonnaise the emulsifier in the egg i.e. Lecithin surround the oil molecules

## **FACTORS AFFECTING STABILITY OF EMULSIONS**

- Type of emulsifier

### **Emulsifier made up of two groups: Polar/Nonpolar**

- Polar group attracted to water
- Nonpolar to oil phase
- If nonpolar is stronger, emulsifier attracted to oil molecules
- Surface tension b/w oil decreased
- Phase whose surface tension is less is continuous phase
- Water becomes dispersed phase, oil becomes continuous phase
- Emulsion is w/o
- Amount of emulsifying agent present
- Size of droplet in dispersed phase-**small size more stable**
- Viscosity of continuous phase (more viscous more stable as dispersed phase has difficulty to move)//**substances which increase viscosity are known as stabilizers**
- Examples of stabilizers: starch, sugar, gelatine, gums
- Temporary emulsions have less emulsifiers and stabilizers, are not thick, dispersed phase molecules bump into each other and coalesce together
- Stable emulsions are very important in food industry

- Broken emulsions are not good in textures and are unappetising curdled appearance
- Permanent emulsions break in extreme temperatures: Hollandaise break in high heat, mayonnaise if frozen break due to formation of ice crystals
- Egg emulsifier-Lecithin
- Milk emulsifier- caseinogen
- Ice cream emulsifier-GMS(glyceryl monostearate)

## **FOAM**

- Gas in Liquid
- Gas in solid
- In foods continuous phase is mostly liquid

Eg---**beaten egg whites/meringues**

- Whipped cream more stable as milk solids and milk fats provide viscosity