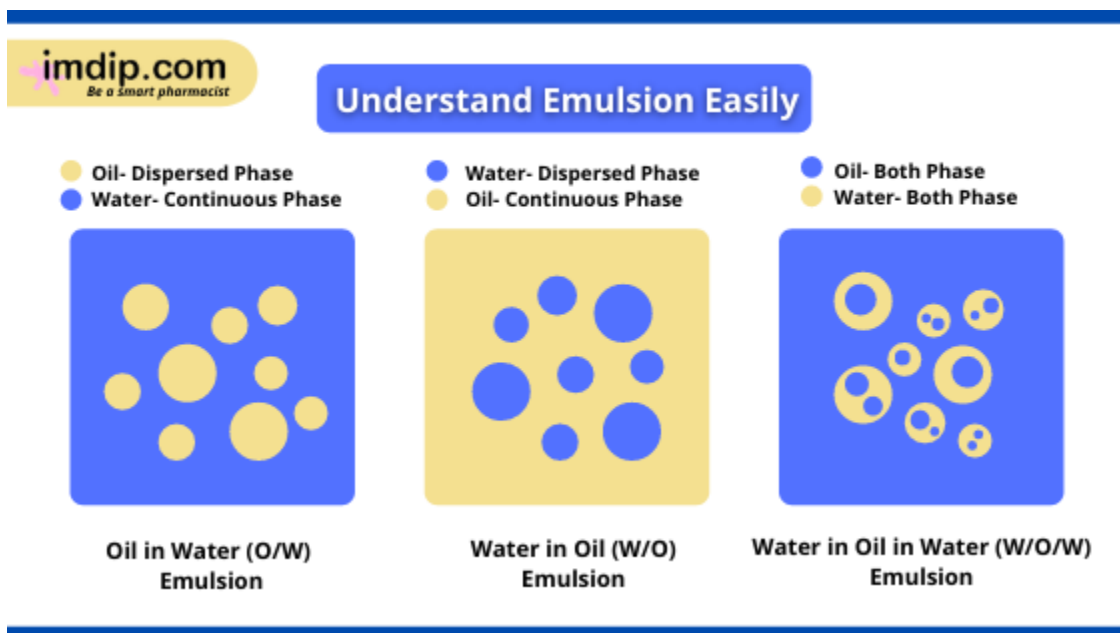


EMULSION

An emulsion is a biphasic **liquid dosage form**. An emulsion is a mixture of two or more liquids that are normally immiscible to each other but using emulsifying agents one liquid is dispersed into other liquid as droplets.

So, there are two phases in an emulsion. One is the dispersed phase and another is the continuous phase. The concept is a dispersed phase (liquid), which is dispersed or spread in the other phase(continuous phase). You can see the picture given below to easily understand.

Examples of emulsions: Milk (fat in water), Butter (water in oil), Liquid paraffin (paraffin in water), etc.



Uses of Emulsion:

- **Pharmaceutical Application:** Due to the high bioavailability and absorption rate, it is used in the pharmaceutical industry. Mostly it is used for topical preparations like creams, lotions, etc.
- **Cosmetic industry:** There is a huge application of emulsion in the cosmetic industry. Example: creams, lotions, hair conditioners, etc.
- **Food industry:** Food products like milk, peanut butter, ice cream, etc. are some examples of emulsion. So you can easily understand the application of emulsion in this industry.
- **Paint industry:** Examples like emulsion paints and inks.
- **Fire extinguisher:** **Thixotropic high internal phase ratio emulsion** is non-flammable. So used as a fire extinguisher.

Advantages of Emulsion:

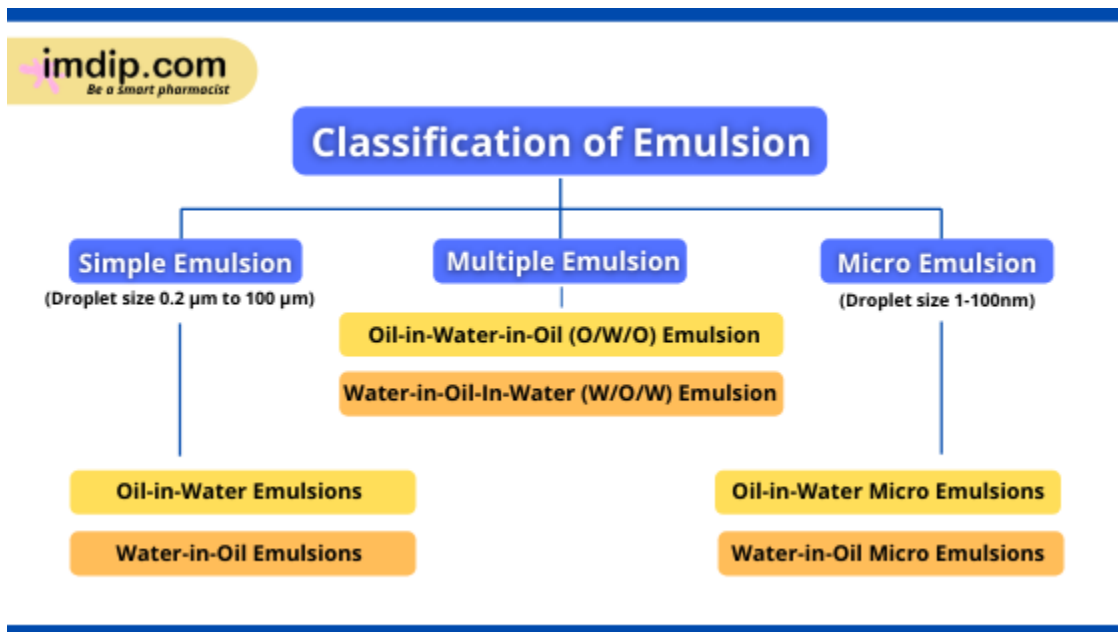
1. Cover up the unpleasant taste.
2. Increase the bioavailability of the dose.
3. Sustained release medication.
4. Very cost-effective

Disadvantages of Emulsion:

1. Problem of creaming and sedimentation
2. Phase inversion
3. problem of handling

Classification of Emulsion:

Basically, there are three types of emulsions-



1. Simple Emulsion:

Oil in Water (O/W) Emulsion
Water in Oil (W/O) Emulsion

2. Multiple Emulsions:

Water-in-Oil-in-Water (W/O/W) Emulsion
Oil-in-Water-in-Oil (O/W/O) Emulsion

3. Micro Emulsions: Size of droplets 10- 200nm

Oil-in-Water Micro Emulsions
Water-in-Oil Micro Emulsions

Difference between Oil in water emulsion(O/W) and Water in oil emulsion(W/O):

Oil in water emulsion(O/W)	Water in oil emulsion(W/O)
For O/W emulsion-water is the continuous phase and oil is the dispersed phase	For O/W emulsion-water is the continuous phase and oil is the dispersed phase
Less viscous and easily washable from the skin by water	More Viscous than O/W and not easily washable from the skin by water
Example- Vanishing cream	Example- Cold cream

Multiple Emulsions: In the case of multiple emulsions, the dispersed phase contains smaller droplets of the continuous phase.