



	Class	Water-in-oil Emulsion	Oil-in-Water Emulsion
1	Name	(Normal/Regular) Emulsion	Reverse (Invert)Emulsion
2	Schematic		
3	Acronym	W/O	O/W
4	Color	Gray, Blue-white, Milky white, Black	Light yellow to brown
5	General Target	BS&W < 0.5% v/v	Oil content < 20 mg/L
6	Importance	Oil products quality	Water re-use, Environmental regulations
7	Feeling	Greasy	Creamy
8	Identification	1. Add water-based dye; the dye will lie in clump forms Or 2. Dilute the emulsion with water; if the emulsion doesn't mix with the water, it is W/O type.	1. Add water-based dye; the dye will dissolve in the body of emulsion Or 2. Dilute the emulsion with water; if the emulsion mixes freely with the water, it is O/W type.
9	Content	When oil content is more than 80% v/v (Could be created in lower oil contents depends on other parameters)	When water content is more than 80% v/v (Could be created in lower water contents depends on other parameters)
10	Definition of Emulsions	Macro	Rapid Settling(unstable): Separates within minutes to few hours
		Meso	Medium Settling(meso-stable): Separates within hours
		Micro	Slow Settling(stable): Separates within days or never
11	Droplet Size of dispersed phase	Macro	Water Droplet Size > 100 micron
		Meso	20 micron <Water Droplet Size < 50 micron
		Micro	Water Droplet Size < 10 micron
			Oil Droplet Size > 100 micron
			20 micron <Oil Droplet Size < 50 micron
			Oil Droplet Size < 10 micron

12	Separation Methods	Macro	-Gravity in high temperature OR gravity in electrostatic field -L-L Hydrocyclone -Centrifugation	-Low residence time Gravity
		Meso	-High residence time Gravity: (Slop) Tank -Chemical Demulsification (in combination with other above methods)	-Gas Flotation -MF -Chemical Demulsification (in combination with other above methods)
		Micro	Slop Treatment Systems: -Heating type -Evaporative type(Flash type) -Centrifuge type -Chemical Demulsification (in combination with other above methods)	-Filtration - L-L Hydrocyclone -Centrifugation -UF -Chemical Demulsification (in combination with other above methods)
13	Emulsion Stabilizing Factors	-Higher oil density -Low water content -Higher oil viscosity -Smaller water droplet size -Existence of emulsifier agents -Low Temperature -High Ca-to-Mg ratio of water droplets -Age	-Higher oil density (?) -Lower oil content -Smaller oil droplet size -Existence of emulsifier agents -Low Temperature -High PH water -Age	
14	Emulsifying agents	-Solids: fine oil-wet particles (e.g. fine sands), Carboxylic acids + Heavy metals -Semi-solid: Ashphaltenes -Liquids: Carboxylic Acids	-Solids: fine water-wet particles (e.g. fine clays), Carboxylic acids + Alkali metals	
15	Demulsifying agents	Demulsifiers: TDS, Alcohol/Aromatic soluble Polymers, Emulsion type	Reverse demulsifiers or Deoilers: Acids(not always effective), Polyvalent metal salts, Water soluble Polymers, Emulsion type(Latex) or Solution type	