



**University of Technology**  
**Chemical Engineering Department**  
**Graduation Project Summary**



- **Supervisor:** Asst. Prof. Dr. Adel Sharif Hamadi
- **Branch:** Oil and Gas Refinery Engineering
- **Groups No. :** R7
- **Students Name:** Ahmed Raheem Kadhim  
Ahmed Auid Mohammed
- **Project Title:** Crude Oil Desalting Unit
- **Specific Objective:**



## 1- Definition and Chemical Formula:

Crude oil contains water, inorganic salts, suspended solids, and water-soluble trace metals. First step in the refining process is to remove salt and solids to reduce corrosion, plugging, and fouling of equipment and to prevent poisoning of the catalysts in processing units. Contaminants must be removed by desalting (dehydration).

A desalter is a process unit in an oil refinery that removes salt from the crude oil. The salt is dissolved in the water in the crude oil, not in the crude oil itself. The desalting is usually the first process in crude oil refining. A crude oil desalter is a device used in petroleum refineries to remove inorganic salts, water and sediment from the incoming petroleum crude oil feedstock before it is refined. This article focuses on the use of electrostatic desalters to produce a dehydrated, desalted crude oil with low sediment content. Almost all refineries now use electrostatic desalters. However, there may still be a few refineries employing the older, less efficient method that utilizes chemicals and settling tanks.

## 2- Other Names:

The most typical methods of crude-oil desalting, chemical, electrostatic, thermal and mechanical separation, use hot water as the extraction agent. In chemical desalting, water and chemical surfactant (demulsifiers) are added to the crude, heated so that salts and other impurities dissolve into the water or attach to the water, and then held in a tank where they settle out. Electrical desalting is the application of high-voltage electrostatic charges to concentrate suspended water globules in the bottom of the settling tank. Surfactants are added only when the crude has a large amount of suspended solids. Both methods of desalting are continuous. A third and less-common process; Mechanical treating or providing increased surface area to promote drop coalescence, and Settling to providing low velocity (reduced turbulence and increased residence time to allow free water to separate). Heate-treating are classed as direct and



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indirect, based on the method of heat application. The clean, dehydrated hot oil can be used to heat the incoming emulsion feed using a shell-and-tube or plate-and-frame heat exchanger. The more corrosive and higher fouling emulsion is fed to the tube side for easier cleaning.

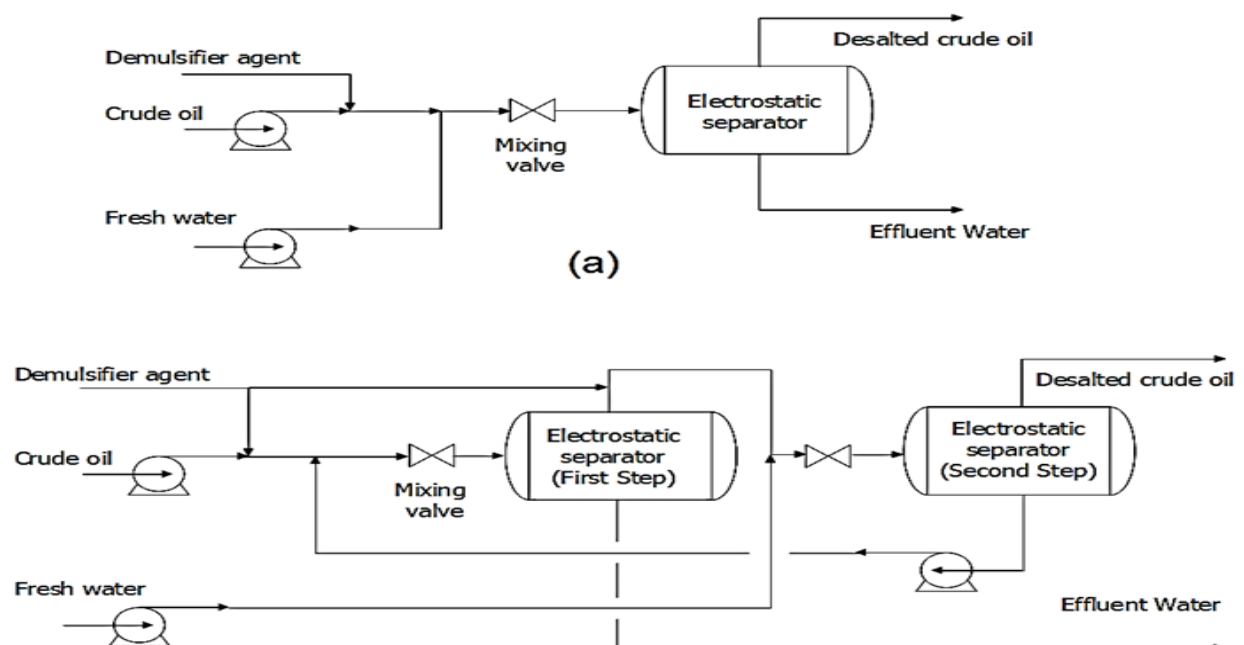
### 3- Goal of Project:

The removal of formation water from wet oil streams has long been an essential part in the crude oil processing. Nevertheless, crude oil desalting and dehydration has become a necessity because of the salts carried to refineries and the problems caused as a result. In most oil refineries, salts and water are removed in day to day operation because of three major reasons: corrosion, scale accumulation and catalyst poisoning.

### 4- Production Methods:

Any method of removing water, salt, sand, sediments, and other impurities from crude oil is called oil treating. Oil-treating methods have one common goal; namely, to provide a suitable environment for gravity to separate the brine from the crude. The following are common treating methods: 1) Chemical Treating. 2) Heat Treating. 3) Electrostatic Treating. 4) Mechanical process.

### 5- Flow Sheet for Selected Production Method:



Crude Oil Desalting Unit