INTRODUCTION: Corrosion is worth investigating in oilfield applications, because corrosion problems represent a large portion of the total costs for oil and gas producing companies every year worldwide. Moreover, appropriate corrosion control can help avoid many potential disasters that can cause serious issues including loss of life, negative social impacts, and water resource and environmental pollution. Corrosion in oilfields occurs at all stages from down hole to surface equipment and processing facilities. It appears as leaks in tanks, casings, tubing, pipelines, and other equipment.

OBJECTIVES:
- To identify the source to collect raw material i.e. the milk dairy wash water scum.
- Extraction of milk scum oil
- Production of biodiesel from milk scum oil (transesterification).
- To study the properties such as calorific value, viscosity, flash point, fire point etc. of the blended fuel samples.
- To successfully corrosion tests on piston material for different samples.
- The corrosion rates of copper, mild carbon steel, aluminium, and stainless steel in biodiesel were decreased in order
- The corrosion process of metal surfaces in the biodiesel was mainly attributed to the chemical corrosion.

MATERIALS AND METHODS:
Corrosion rate is the speed at which any metal in a specific environment deteriorates. It also can be defined as the amount of corrosion loss per year in thickness. The speed or rate of deterioration depends on the environmental conditions and the type and condition of the metal under reference. The corrosion rate is measured by using the equation

\[ k = \frac{(m_2 - m_1) \times 24 \times 365}{p \times t \times S \times 1000} \]

Where \( m_1 \): weight before corrosion in gram; \( m_2 \): weight after corrosion in gram; \( k \): corrosion rate, mm/year; \( p \): density in g/cm³;

A scanning electron microscope (SEM) scans a focused electron beam over a surface to create an image. It uses a focused beam of high-energy electrons to generate a variety of signals at the surface of solid specimens. The signals that derive from electron-sample interactions reveal information about the sample including external morphology (texture), chemical composition, and crystalline structure and orientation of materials making up the sample. In most applications, data are collected over a selected area of the surface of the sample, and a 2-dimensional image is generated that displays spatial variations in these properties. Areas ranging from approximately 1 cm to 5 microns in width can be imaged in a scanning mode using conventional SEM techniques (magnification ranging from 20X to approximately 30,000X, spatial resolution of 50 to 100 nm).

Essential components of all SEMs include the following:
- Electron Source ("Gun")
- Electron Lenses
- Sample Stage
- Detectors for all signals of interest
- Display / Data output devices
- Infrastructure Requirements:
  - Power Supply
  - Vacuum System
  - Cooling system
  - Vibration-free floor
  - Room free of ambient magnetic and electric fields

CONCLUSIONS:
1. The corrosion effects of biodiesel on copper is more severe than those on aluminium and stainless steel, also the corrosion effects of diesel on copper is more severe than those on aluminium and stainless steel.
2. The corrosion rates of copper, aluminium, and stainless steel in biodiesel are 0.0202, 0.00307, and 0.00122 mm/year, respectively.
3. The corrosion rates of copper, aluminium, and stainless steel in diesel are 0.00752, 0.00627 and 0.001882 mm/year, respectively.

4. The corrosion mechanism of biodiesel on metals should mostly be attributed to the chemical corrosion. The corrosion products were primarily fatty acid salts or metal oxides.

5. Elements of copper are catalysts for the decomposition of biodiesel because they enabled various chemical reactions to easily take place.

6. Their corrosion volumes increased with corrosion time and temperatures in cases of stainless steel, aluminium and copper.

7. Corrosion decreases the weight of the metal due to metal losses because of Corrosion product, iron oxide is a flaskey substance.