INTEGRATED PETROLEUM ENGINEERING LABORATORY

This laboratory is equipped with latest equipment covering a wide range of Petroleum Engineering experiments. Equipment details are given below:

GAS PERMEAMETER

Gas Permeameter is utilized to measure permeability to gas, primarily on clean and dry core samples taken from petroleum reservoirs. These permeability measurements are utilized to aid a reservoir engineer in determining the flow characteristics of a reservoir. Permeability to gas is one of the basic data sets utilized by geologists and reservoir engineers to determine the economic feasibility of a particular formation or reservoir. The equipment utilizes a steady-state flow technique and is operated manually. Measured pressure and flow data from the digital display meters on the front panel are used to calculate permeability after reaching steady-state flow conditions.

LIQUID PERMEAMETER

Liquid Permeameter is a manually operated system designed for performing simple liquid permeability tests at pore pressures up to 100 psi with confining pressures up to 500 psi. Plug size core samples are held in a hassler core holder mounted vertically. The core holder can accommodate 1.5" diameter core samples one to three inches in length. The system is equipped with differential pressure transducers and digital readouts, which have ranges of 0-30 and 0-100 psi. A manually operated hydraulic pump is used to generate confining pressures to 500 psi.
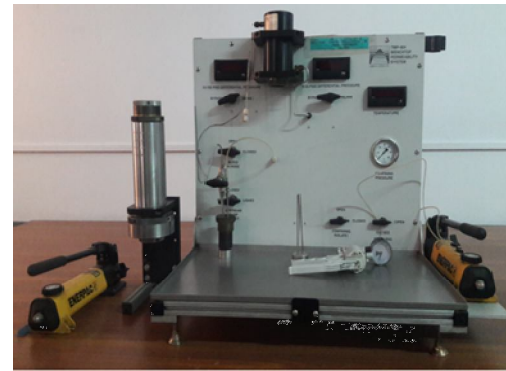
CORE SATURATOR

Core Saturator is designed to provide a simple yet modern method to saturate core samples with brine or oil. The control panel offers a pneumatically operated high pressure pump to pressure saturate the core samples to 2000 psig. The pneumatic pump offers simple operation via an air control valve to pump up the pressure saturator cell. Sample saturation is accomplished by loading the saturator cell with core samples then evacuating the cell for at least four hours (highly permeable samples) then filling the saturator cell with the brine or oil that is to be utilized to saturate the core samples. After the cell has been filled with the saturating fluid, the cell is pressurized to 2000 psig for at least two hours. The pressure is then slowly bled down and the samples are removed from the cell and submerged under saturating fluid in a container.
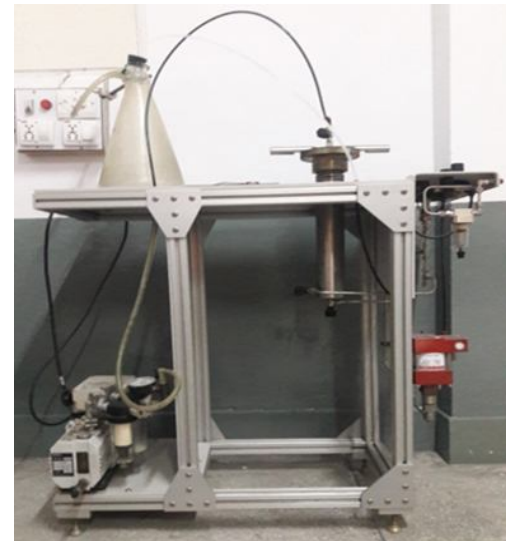
CAPILLARY PRESSURE SYSTEM

Capillary Pressure Systemconsists of a gas pressure control panel and sample cell. The two components combine to enable capillary pressure measurements to be performed at pressures up to 200 psig (air/water) with humidified gas for extended periods of time. The primary use for capillary pressure data is to relate permeability and/or porosity in a reservoir to water saturation at different heights above the oil/water contact. Capillary pressure data can also be used to calculate reservoir hydrocarbonsaturation, pore size distribution information and relative permeability characteristics.

HELIUM POROSIMETER

Helium Porosimeter is primarily used to determine the grain volume of a sample of earth material. The basic principle behind the measurement is Boyles Law which describes the relationship between the volume of a dry ideal gas and its pressure.Grain volume and pore volume measurements can be made with this equipment at pressures up to 95 psi.

CORROSION STUDY KIT

Corrosion Study Kitis used for testing and evaluation of metal specimens in corrosive environments. The kit permits a series of metal specimens and liquid environments to be tested quickly and uniformly at the same time. The kit is fitted with air supply to provide aerobic environment to corrosive medium, if required. Each jar has three pairs of metal strips to test different metals in same corrosive environment. The lids of the jars are fitted with six leads which are connected with metallic strips to provide potential difference. Rate of corrosion is measured by weight loss method which is based on Faraday's Laws of Electrolysis.

CORE EXTRACTION SYSTEM

Coret Extractoris used to extract oil, salt and other residual impurities from a reservoir core sample to be tested for porosity and permeability. All liquid elements extracted in other procedures do not remove salt. A Core Extractor works by boiling a solution that has a solute of limited solubility in a percolator, then cooling and collecting the condensate in a reservoir from which the concentrated solute can be extracted. This is accomplished by percolating methanol through the core sample. Methanol is used because salt is soluble in methanol..