



PCE120

Crude and Petroleum Products Specification & Analysis

Course Introduction:

Upon the successful completion of this course, participant will gain enough knowledge in Crude & Petroleum Products Specification & Analysis Nature of Crude Oil ,Crude Oil Assays & Analytical Methods ,Crude Oil Specification & Marketing ,Variability in Crude Oil Quality ,ASTM & Simulated Distillation of Crude Oil ,Significance of Crude Oil Distillation to Refining Processes ,Crude Oil Chemistry & Contaminants ,Significance of Contaminant on Refining Processes ,Product Compositions, Specification and their significance , Product Sampling, Testing and Reporting , in addition actual case studies from around the world will be demonstrated to highlight the topics discussed.

Course Objectives:

The aim of this course is to provide participants with a complete and up-to-date overview of the Crude & Petroleum Products Specification & Analysis in modern refineries.

Who Should Attend?

The course is intended and will be useful for junior and senior laboratory technicians, supervisors, chemists and senior chemists, as well as production planning, marketing and refinery products quality groups who are involved in day-to-day refinery activity within the refinery organization.

Course Outline:

Day 1:

Introduction to Nature and Types of Crude Oils

- Nature of crude oils
- Paraffin-Base Crude Oil
- Aromatic -Base Crude Oils
- Naphthenic -Base Crude Oils
- Asphaltic - Base Crude Oils
- Mixed-Base Crude Oils

Crude Oil Assays & Analytical Methods

- TBP crude oil distillations by ASTM D 2887
- Pot still Distillations by ASTM D 5236
- Calculated Yields
- Instruments Description
- Fraction intervals to your choice

- More detailed analyses on fractions
- Assay Speed and Cost Advantages

Day 2:

Variability in Crude Oil Quality

- Specific Gravity at 15c
- Sulphur content
- Reid Vapor
- Salt contents
- Viscosity Kinematic

ASTM D-5307 & Simulated Distillation of Crude Oil

- Comparison between SIM DIST and TBP
- Gas Chromatograph Technique
- Calibration and Separation
- Sample preparation
- Results
- Final Report

Day 3:

Significance of Crude Oil Distillation to Refining Processes

- Distillation (Fractionation)
- Hydro treating and sulphur plants
- Removal of Sulphur, Nitrogen and metal compounds, and the production of light products.
- Hydro treating can be used to improve the quality of pyrolysis gasoline (pygas), a by-product from the manufacture of ethylene.
- The quality of pygas, which is high in diolefin content, can be satisfactorily improved by hydrotreating
- Hydro treating can be used to improve the burning characteristics of distillates such as kerosene by converting aromatics into naphthenes, which are cleaner-burning compounds.

Crude Oil Chemistry & Contaminants

- Organic Chlorides
- Vanadium
- Iron
- Basic Nitrogen
- Naphthenic Acid
- Phenolic Compounds in Crude Oil
- Zinc (Used Lubricating Oils)

- Methanol

Day 4:

Significance of Contaminants on Refining Processes

- VOC emissions
- Solid waste and sludge
- Salts in the feedstock (corrosion and fouling problems) and aromatics (source of VOC)
- Aromatics, oil, grease and organic removal
- Phenol and ammoniacal nitrogen removal with a biological treatment
- The organic and inorganic contaminants from refinery wastewater
- Oily water separation
- Process water

Product Compositions, Specification and their significance

- LPG
- Gasoline
- Kerosene and Fuel
- Gas Oil
- Atmospheric Residue
- Vacuum Residue
- Petroleum Coke

Day 5:

Summary of whole Crude Characteristics:

- Specific Gravity
- Density
- Reid Vapour Pressure
- Water Contents
- Sulphur Contents
- Salt Contents
- Sulfur Mercaptan and H₂S
- Viscosity
- Light Ends

Product Sampling, Testing and Reporting:

- ASTM D4177 - 95(2010) Standard Practice for Automatic Sampling of Petroleum and Petroleum Products
- ASTM D4057 - 06 Standard Practice for Manual Sampling of Petroleum and Petroleum Products

- Sampling System inside and outside laboratory

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Methodology:

A variety of methodologies will be used during the course that includes:

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

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Course Fees:

To be advised as per course location. This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee / Tea
08:20 - 10:00	First Session
10:00 - 10:20	Coffee / Tea / Snacks
10:20 - 12:20	Second Session
12:20 - 13:30	Lunch Break & Prayer Break
13:30 - 15:00	Last Session

