

PETROLEUM REFINING: CATALYTIC PROCESSES

(Elective-III)

Course Code: 15CH2116

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Course outcomes: On successful completion of the course, the student should be able to

CO1: Recognize the role of catalysis in refining.

CO2: Classify the various reforming, alkylation & isomerization processes.

CO3: Differentiate thermal & catalytic cracking processes.

CO4: Interpret the cases of various operations like HDS, HDN, HDO processes.

CO5: Recognize the importance of FCC process and heavy oil upgradation.

UNIT-I (10-Lectures)

Introduction principles of heterogeneous catalysis and catalysis in petroleum refining. Role of Catalysis in petroleum refining.

UNIT-II (10-Lectures)

Catalytic reforming process chemistry, Technology and catalysis alkylation and Isomerization and oxygenate synthesis, oligomerization.

UNIT-III (10-Lectures)

Catalytic cracking raiser cracking, fluid catalytic cracking process chemistry, Technology and catalysts, residue fluid catalytic cracking.

UNIT-IV (10-Lectures)

Hydrotreating Science and Technology hydro desulfurization, deep and ultra deep desulfurization hydro denitrogenation and hydro deoxygenation, Reacting catalyst and processes

UNIT-V

(10-Lectures)

Hydro cracking comparison of FCC and hydro cracking. Chemistry Technology and catalysis involved in hydro cracking. Heavy oil upgrading processes.

TEXTBOOKS:

1. Baskara Rao B.K, “*Modern Petroleum Refining Processes*”, 4th Edition, Oxford & IBH Pub. Co. Pvt.Ltd, 2002.
2. Baskara Rao B.K, “*A Text on Petrochemicals*”, Khanna Publishers, 2002.

REFERENCES:

1. Nelson W.L, “*Petroleum Refinery Engineering*”, McGraw Hill, New York 1961.
2. Hengstebeck R.J, “*Petroleum Refining*”, McGraw Hill, New York 1959.
3. Steiner H, Pergamon, “*Introduction to petroleum Chemical Industry*”, London, 1961.
4. Sern V.Y, Pergamon, “*Gas phase oxidation*”, London, 1964.
5. Waddams A.L., “*Chemicals from Petroleum*”, 4 Rev Ed, John Murray Pub. 1978.
6. KNIEL, WINTER & STOCK “*Ethylene Derivatives*”, Marcell Dekker Publishers.
7. Sinha N K, “*Petroleum Refining and Petrochemical*”, Umesh Pub. 2003.
8. Sharma B.K., “*Fuels and Petroleum Processing*”, Goel Pub. House, 1998.