

UCH504 ENERGY TECHNOLOGY

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Energy Scenario: Indian and global, Energy crisis, Classification of various energy sources, Renewable and Non-renewable energy sources, Pattern of energy consumption, Present and future energy demands.

Solid Fuels: Coal its origin and formation, Coal analysis, Coal classification, Coal preparation, Coal washing and coal blending, Coal carbonization, Treatment of coal gas and Recovery of chemicals from coal tar, Coal gasification, Liquid fuel synthesis from coal, Carbonization of coal, Briquetting of fines, Bio Mass,

Liquid and Gaseous Fuels: Crude petroleum, Physical processing of crude petroleum, Fuels from petroleum, Storage and handling of liquid fuels, Natural gas and Liquefied Petroleum gases, Gas hydrates, Gasification of liquid fuels, Carbureted water gas, Bio gas

Fuel Characterization: Viscosity, viscosity index, Flash Point, Cloud point, Pour point, Fire point, Smoke point and Char value, Carbon residue, Octane number, Cetane number, Aniline Point and Performance number, Acid value, ASTM distillation, Calorific value, Proximate and ultimate analysis.

Energy Conversion without Combustion: Solar energy, Radiation measurement, Applications and types of collectors and storage, Wind power, Principle of energy from wind applications, Geothermal energy, Biomass, Biogas and Thermal gasification, Nuclear power, Fuel cells.

Laboratory work: Experiments on proximate and ultimate analysis of fuels, Orsat analysis, Surface tension, Cloud, Pour and flash point, Redwood and Saybolt viscometers, Melting point, Reid vapor pressure, ASTM distillation, Saponification value.

Text Books:

1. Rao, S. and Parulekar, B.B., Energy Technology-Non-conventional, Renewable and Conventional, Khanna Publishers (2000).
2. Gupta, O.P., Elements of Fuel, Furnaces and Refractories, Khanna Publishers (1996).
3. Rai, G.D., "Non-Conventional Energy Sources," Khanna Publishers (2001).

Reference Books:

1. Brame J.S.S. and King J.G., Edward Arnold "Fuel Solid, Liquid and Gases" Edward Arnold (1967).
2. Sukhatme S.P, "Solar Energy - Principles of Thermal Collection and Storage", Tata McGraw- Hill (1996).
3. I.S. Code 770, Classification of Coal.