



Course Name: Master of Science

Discipline: Chemistry

CHOICE BASED CREDIT SYSTEM

(For those who joined in June 2015 and after)

Self Learning Courses:

Year	Semester	Subject	Credit	Ext =Tot	Subject Code
II	III	Applied Chemistry	5	100 = 100	P1CHSL3

APPLIED CHEMISTRY

Credit: 5

Subject Code: P1CHSL3

Total marks 100

Unit I FUELS

Classification of fuels – Calorific value- characteristics of a good fuel- Comparison between solid, liquid and gaseous fuels - Coal –chemical constitution and types – Petroleum - classification and composition- Petrol- Kerosene-Diesel- Comparative account of diesel and petrol – Cracking - Knocking - Octane rating - Diesel- index- Natural gas - Coal gas - Oil gas – Producer gas - Water gas- Biogas.

Reference:

1. P. C. Jain & M. Jain, Engineering Chemistry, Dhanpat Rai Publishing Company, 2000.
2. B. K. Sharma, Industrial Chemistry, Goel Publishing House, Meerut, India, 1994.

Unit II MATCH INDUSTRY

Advantages of Safety matches over Lucifer matches – Preparation, properties and uses of chemicals in matchstick head: $KClO_3$, KNO_3 , Sulphur, Antimony sulphide, Borax, MnO_2 , Wax, Glue and Potassium dichromate.

Body composition of colour and/or star matches: Colour matches: $KClO_3$, Barium nitrate, Strontium nitrate, Shellac, Lamp black, Paris green, Resin, Denatured spirit. Manufacturing process of matchsticks – Dipping process: Wax dipping and chemical dipping, drying - automation process.

Manufacture of conventional fireworks products: Flower pot, Ground chackra, Sparkles, Pencil, Crackers, Rockets and Atom bomb, Aerial Shots – Fuse making – Caps and ring caps – gun powder, serpent egg.

Reference:

1. P. L. Sony, "Text Book of Inorganic Chemistry" Mohan Katya Sultan Chand and Sons – New Delhi, 2013.
2. K. N. Ghosh, "The principles of fire works" 1987, Sivakasi.

UNIT-III VEGETABLE OIL INDUSTRY

Cleaning, Dehulling, Heat treatment of oil seeds, Rendering & Cooking types of rendering – Solvent extraction method of oil extraction – Various solvents used for solvent extraction - Modern extraction of gingelly oil from sesame seed.



Refining – effect of refining – types of refining – adsorption method- bleaching – chemical methods of bleaching – deodourisation.

Determination Acid Value (% FFA) – Iodine Value – Bellier Turbidity Temperature for gingelly and groundnut oils.

Reference:

1. C. Paquot, Standard methods for the analysis of Oils, Fats and Derivatives, 6th edition, Pergmon press, 1979.
2. E. A. Weiss, Oilseed Crops, Longman Group Limited, London, 1983.
3. F. D. Gunstone, An Introduction to the chemistry and Biochemistry of Fatty acids and their Glycerides, Chapman and Hall Ltd, 1967.
4. S.BP Board of Consultants and Engineers, Fatty Acids and Products, Small Business Publications, 1970.

UNIT-IV PAINTS AND PIGMENTS

Paints and pigments - formulation, composition and related properties. Oil paint, vehicle, modified oils, Pigments, toners and lakes pigments, Fillers, Thinners, Enamels, emulsifying agents. Special paints (Heat retardant, Fire retardant, Eco-friendly paint, Plastic paint), Dyes, Wax polishing, Water and Oil paints, additives, Metallic coatings (electrode and electrolytic), metal spraying and anodizing.

Reference:

1. B. K. Sharma, Industrial Chemistry, Goel Publishing House, Meerut, India, 1994.
2. P. C. Jain & M. Jain, Engineering Chemistry, Dhanpat Rai Publishing Company, 2000.

UNIT V PLASTIC RECYCLING

Introduction to plastic wastes - Sources of plastic wastes - Generation of industrial plastic wastes- Plastics in solid wastes- Future of waste disposal - Primary recycling - Degradation of thermoplastics (Industrial practices) - Secondary Recycling - Approaches to secondary recycling - Chemical modification of mixed plastic waste - Secondary recycling by Co-extrusion & Injection molding - Use of waste plastics as Filler - Tertiary Recycling - Chemicals from waste - Pyrolysis - Chemical decomposition - Quaternary Recycling - Energy from plastic waste - Recycling of Various Plastics: HDPE, Acrylics, PET, PVC, Medical Plastics - Resin Identification Number (RIN) and its significance in recycling of plastics.

Reference:

1. Plastic Wastes in the Environment, Institute of European environmental Policy, 2011.
2. Good Practices Guide on Waste Plastic Recycling, by Local and Regional Authorities.