

ICE 509: AGRICULTURE & HEALTH CARE CHEMICALS

Course objectives

- To study classification of fertilizers, their synthesis and applications.
- To learn about characteristics of insecticides, preparations and their uses in agriculture.
- To know various methods of preparations of healthcare chemicals like soaps and detergents, perfumes.
- To learn the techniques of quality assessment and controlling measures.

UNIT I:

12 hr.

Fertilizers: Introduction, Essential plant Nutrients, Classification of Essential Nutrients, Primary Nutrients, Secondary Nutrients, Micronutrients, Macronutrients, Classification of Fertilizers- Straight Fertilizers, Compound/Complex Fertilizers, Fertilizer Mixtures, Feed Stock/ Raw materials- Nitrogenous Fertilizers, Phosphatic Fertilizers, Potassic Fertilizers, Manufacture and general properties of Fertilizer products- Intermediates- Ammonia, Nitric Acid, Sulphuric Acid, Phosphoric Acid, Nitrogenous Fertilizers- Ammonium Sulphate, Ammonium Nitrate, Calcium Ammonium Nitrate, Calcium Nitrate, Ammonium Chloride, Urea, Phosphatic Fertilizers, Ground Rock Phosphate, Single Superphosphate, Triple Superphosphate, Potassic Fertilizers- Potassium Chloride (Muriate of Potash), Potassium Sulphate (Sulphate of Potash), Potassium Nitrate, Complex Fertilizers- Ammonium Phosphate Sulphate, Ammonium Phosphates, Mono Ammonium Phosphate (MAP), Di-Ammonium Phosphate (DAP), Nitrophosphates, Urea Ammonium Phosphates, NPK Complex Fertilizers, Fertilizer mixtures-Physical Mixtures, Granulated Mixtures.

UNIT II

10 hr

Insecticides: Introduction, classification, Organochlorine insecticides-BHC, DDT, endosulfan, sevin, Insect pheromones, general introduction and applications in integrated pest management.
Repellents: Survey & synthesis of the repellents-N,N-diethyltoluamide, 2-ethyl-1,3- hexanediol,.
Fungicides: Introduction, Inorganic & organic fungicides, Systemic fungicides-types & examples.
Herbicides: Introduction, study of sulfonyl ureas, Mechanism of action and toxicities of insecticides, fungicides and herbicides.

UNIT III

10 hr

Perfumery: Introduction, Compounds used in perfumery and their classification, methods of preparation and importance of phenyl ethanol, Yara yara, Ionone musk ketone, musk ambrette, musk xylene, phenyl acetic acid and its esters, benzyl acetate, synthetic musks and jasmine.
Essential oils: Source, constituents, isolation & uses.

UNIT IV

10 hr

Oils, soaps and Detergents: Refining of edible oils, manufacturing of soaps, detergents- classification-anionic, cationic, non-ionic and amphoteric detergents, detergent builders and additives, liquid soaps. Manufacturing of fatty acids and glycerol, greases from fatty acids, turkey red oil

Food Analysis: Moisture, ash, crude protein, crude fiber, fat, carbohydrate, calcium, potassium, sodium and phosphates, food adulteration-common adulteration in food, contamination of food stuffs, microscopic examination of food for adulterants, pesticide analysis in food products.

Course Out come

- The students will be knowing about the different types of fertilizers and the synthesis and methods of use.
- The candidates will be learning about the insecticides and their uses in agriculture
- The students will be learning about the healthcare chemicals like soaps and detergents, perfumes
- They will also learn about the food quality assessment

References

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