



FACULTY OF ENGINEERING AND TECHNOLOGY

UNIT-1ST

TOPIC – 1ST

PRODUCTION OF INDUSTRIAL CHEMICALS & CHEMOTHERAPEUTIC PRODUCTS

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Introduction

- The branch of chemistry which applies physical and chemical procedure towards the transformation of natural raw material and their derivatives to products that are of benefits to humanity.
- Fermentation (chemical reactions) is a physical process on a large scale to convert raw materials into useful products.
- Conditions of the reactions are controlled to produce the best yield of product possible at an economic rate.

Cont...

- Industrial chemicals are used in a multitude of processes that impact every area of human society.
- Industrial chemicals and product are used food and drug industries to the chemicals industry to construction. Yet, processes to produce these chemicals can create harmful by-products and, therefore, scientists are turning to other technologies to produce them.
- Commonly produced chemicals include oxygen, nitrogen, phosphoric acid, sulfuric acid, chlorine, ethylene, sodium carbonate, urea, ethanol, ethylene, acetone, and methanol.
- For example, sodium carbonate is used in glass manufacture, urea is used in cattle feed and fertilizer, phosphoric acid is utilized in the food industry and to produce fertilizer, ethanol is used for fermentation and other industrial processes.

- Industrial fermentation products or solutions, and microbes are one of these solutions. As well as being easily and readily available and cheap to produce, they are sustainable and any remaining “spent” biomass can be utilized in other industries.
- Possibly the most useful application of industrial fermentation is the utilization of microorganisms in the production of alcohols or acids for example, ethanol and methanol and acetone etc.
- The fermentation of sugars by microorganisms has been used to produce alcohol for thousands of years. These chemicals have many uses within modern industry including biofuel production.

(Keller, M.W. *Et.,al* 2013)

- To manipulate microorganisms such as bacteria and fungi at the genetic level to produce new tailor-made strains that can produce a multitude of chemical products.
- While many of the products from the industry, such as detergents, soaps and perfumes, are purchased directly by the consumer others are used as intermediates to make other products.
- Industrial fermentation is a complex of processes, operations, and organizations engaged in the manufacture of chemicals and their derivatives.

Industrial Chemical

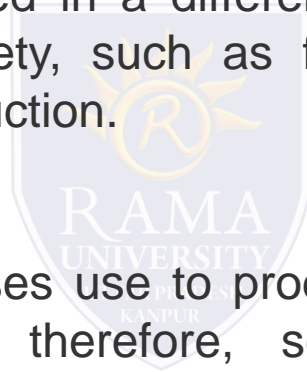
An Overview of the industrial Chemical Process of fermentation Industry and Primary Raw Materials.

The chemical process industry includes those manufacturing facilities whose products are:

1. Chemical reactions between organic materials, or inorganic materials.
2. After that the extraction, separation, or purification of a natural product.
(with or without the aid of chemical reactions)
3. The preparation of specifically formulated.

With the help of Biotechnology process we can manipulate microorganisms such as bacteria and fungi at the genetic level to produce new tailor-made strains that can produce a multitude of chemical products.

- Industrial chemicals are used in a different type of processes that impact every area of human society, such as food and drug industries to the chemicals industry to construction.
- Industrial chemicals processes use to produce these chemicals can create harmful by-products and, therefore, scientists are turning to other technologies to produce them.



Chemotherapeutic agents

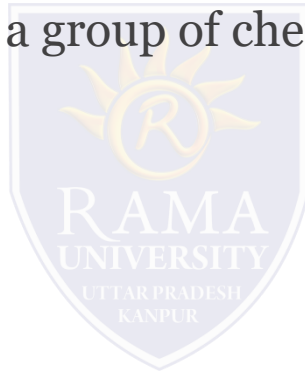
- ✓ Chemotherapeutic agents are chemical substances used in the body for therapeutic purposes.
- ✓ Chemotherapeutic a chemical that has been synthesized by chemists or produced by a modification of a preexisting chemical. By contrast, an antibiotic is a product of the metabolism of a microorganism.
- ✓ Although many antibiotics are currently produced by synthetic or semisynthetic i.e. known as “chemotherapeutic agents.”
- ✓ To control and cure disease, the efforts of early microbiologists were primarily directed toward enhancing the body’s natural defenses.
- ✓ Sera containing antibodies lessened the impact of diphtheria, typhoid fever and tetanus; and effective vaccines for smallpox and rabies (and later, tuberculosis, diphtheria, and tetanus) reduced the incidence of these diseases.

(Kiruthikas S *et.*, *al* 2020)

Groups of Chemotherapeutic Agents:

Sulfanilamide and Other Sulfonamides:

Sulfanilamide was the first of a group of chemotherapeutic agents known as sulfonamides.



(Kiruthikas S *et. al* 2020)

THANK YOU