Lab1

Requirement for industrial fermentation

* **Industrial Microbiology**: Use of microbes to obtain a products or services of economic value constitutes industrial microbiology.
* Any process involving microorganisms in which a product of economic value is obtained called fermentation.
* **Purity of microorganisms** you must be sure about the purity of the culture of microorganisms which must have been fixed properties and have ability for rapid growth and not pathogen we use genetically modified microorganisms.
* **Growth conditions** microorganisms grow well in culture media when provide with optimal conditions as temperature, PH, nutrient and aeration.
* **Growth media** the fermentation media should be cheap and available such as byproducts of many factories as paper and daires products.
* **The final product** large tanks must be used, these products formed as result of metabolic reaction of microorganisms may be more heterogeneous so you must remove to obtain pure product and maintain the microorganisms stable at the beginning and at the end of the fermentation process.

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Type of culture media used in industrial fermentation

* **synthetic media**
* **Crude media** there are many types of crude media used in industrial.
* **Molasses** it is the dark, sweet, syrupy byproduct formed during the extraction of sugars from and sugar beets; molasses can vary in color sweetness and nutrition; it contains level of the vitamins and minerals that were present in the sugarcane like calcium, magnesium and potassium.
* **Whey** is yellow liquid byproduct of chees production containing the water-soluble component it is composed of high level of lactose 75% and 12-14% protein and organic acid mineral vitamins.
* **Starch** extraction from wheat, malt, corn, rice and potatoes it is consider as cheap media and used as culture media in fermentation after hydrolysis by amylase to produce malt which use as culture media for yeast**.**
* **Corn steep** liquor it is white liquid byproduct of starch production it's contain nitrogen compound, growth factor and vitamins.
* **Wood molasses** it is byproduct of wood production contains soild compound**.**
* **Hydrocarbon** we can use derived crude oil as pure or mixture for growing microorganisms such as ***Candida albicans*** grow on hexadecane to produce cytochrome C and bacterium ssp. Use hydrocarbon to produce L-tryptophan.
* **Sulphit waste liquor** it is remenant of paper factory this contains sugar produce from hydrolysis of hemicellulose.

Lab1

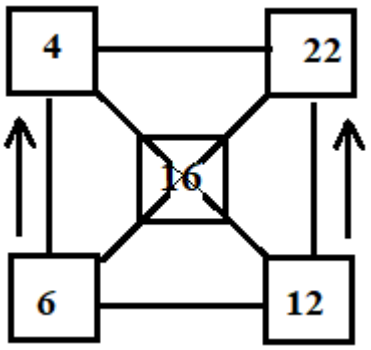
Preparation of sugar and salt solutions

We can prepare solutions by (Person square)

1- We put the unknown concentration of the solution in the middle of the sequare and we put the known concentration at the upper corner of the sequare, Then we wust minus the small Concentration from the big concentration and we put the result at the lower.

Example:

Prepare 120 K. of sugar solutions of 16% from two sugar solutions have 22% and 4% concentration respectively.



$\frac{part}{to\ lot\ part} \times solution\ weight$

12 + 6 = 18 to tat part.

$\frac{12}{18} \times 120\ K. = 80\ K.$ taken from 22% con c.

$\frac{6}{18} \times 120\ K. = 40\ K.$ taken from 4% con.

80 + 40 = 120 K.