Toxicity of hydrocarbon on microorganisms

Several classes of organic compounds are toxic for living organisms as they accumulate in and disrupt cell membranes.

Hydrocarbon compounds are compounds composed entirely of carbon and hydrogen.

Hydrocarbon compounds are: Aromatic hydrocarbons, alkanes, alkenes, cycloalkanes, alkynes, and combinations of these compounds comprise different types of hydrocarbons. Complex mixtures of hydrocarbons occur naturally in crude oil and gasoline.

Classification of hydrocarbon

- The toxic effect of most hydrocarbons is caused by <u>nonspecific effects on membrane fluidity due to their accumulation in the lipid bilayer.</u>

The toxicity of hydrocarbon compounds plays an important role in:

1- Microbiology.

2-Biotechnological application of microorganisms.

Toxicity of hydrocarbon

The major reason why hydrocarbons are toxic to microbial cells is due to their preferential partitioning into membranes causing an increase in the fluidity of the membrane that leads to its non-specific permeabilization.

Toxicity hydrocarbon compound

Toxicity of hydrocarbon compound

- The toxicity of hydrocarbon depended on the following:
- 1- abiotic condition
- Temperature
- pH

- radiation

2- Biotic conditions

Type of microorganisms

Hydrophobicity

Extracellular enzyme

3- polymer properties

Molecular weight

Size and shape

Functional groups

Procedure:

1-preparation media for different types of bacteria

1-

2-

3-

4-

2- adding hydrocarbon compound to the media by different method:

two different methods were evaluated as follows:

1- agar diffusion test

2- wells in dishes

3- Adding bacteria to the medium

1-

2-

3-

4-

5-

4-Incubate the cultures of bacteria for 24-48 hr at 37 C^o.

5- After incubation time, measuring the growth zone of each bacteria.

6- Record your results

7- which of them (hydrocarbon compound) is more toxic???

8- Write your discussions.