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HYDROCARBON EXTERMINATOR™

HYDROCARBON EXTERMINATOR is a developed biological product composed of natural aerobic, Anaerobic and facultative bacteria that have been adaptively selected to break down and eliminate the hydrocarbons in soil or sludge.

Biochemistry of Hydrocarbon Transformation Using Bioremediation

Petroleum and petroleum products consist of organic compounds and hydrocarbons whose molecules contain carbon and hydrogen and are generally insoluble in water. Some hydrocarbons are aliphatic compounds, a class of carbon compounds in which the carbon atoms are joined in an open chain. There are tremendous variations among aliphatic hydrocarbons in chain length, degree of branching, and the number of double bonds. Another important group of hydrocarbons contains the aromatic ring and can be view as derivatives of benzene.

Transformation of Aliphatic Hydrocarbons

Relatively few kinds of microorganisms (*Pseudomonas Mycobacteria*, and certain yeast's and molds) can utilize hydrocarbons. Intracellular hydrocarbon metabolism is a complex process, which consists of absorption of the hydrocarbon substrate on the cell wall, diffusion through the cell wall and cytoplasmic membrane and the enzymatic reaction within the cell.

The initial oxidation of aliphatic hydrocarbons involves molecular oxygen (O2) oxidized as a reactant, and one of the atoms of the oxygen incorporated into the oxidized hydrocarbon. This reaction, called oxygeneses, is carried out by three different enzymes (monomethanoxigenase, alcoholdehydrogenase, aldehydehydrogenase), which activate oxygen and convert it to a form in which the oxygen atom can be incorporated directly into a biochemical compound. The end product of the reaction sequence is fatty acid as shown in Figure 1.

Biotransformation of Aromatic Hydrocarbons

Many aromatic hydrocarbons can be used as electron donors aerobically by microorganisms. The biochemistry of this process is relatively well established. It has been demonstrated that the metabolism of these compounds, some of which are quite complex, almost always has its initial stage the formation of two molecules, protocatechuate and catechol. (refer to Figure 2-a, b, c).

Figure 2. Aerobic catabolism of aromatic coumpunds

(a) Procatchuate and catachol

(b) Hydroxylation of benzene to catachol

(c) Cleavage of catachol cis, cis-muconateby deoxygenase.