Applications of Alkaliphiles

Introduction

- Alkaliphilic microbes have made large impact
- Biological detergents
- Contain enzymes obtained from alkaliphilic or alkalitolerant bacteria
- Traditional craft industry of leather tanning

Detergents

- Biotex
- Used as pre wash laundry detergent
- Contain alkaline proteases
- Alcalase
- from B.licheniformis
- Most commonly used enzymes in detergent formulations are proteinases

- PROTEINASES
- Ser processes
- Alkaliphilic Bacillus sp
- Endopeptidase
- Reactive Ser molecule is present at active site
- Alcalase,Esperase,Maza tase,maxacal

- maxatase ; alkaline processes = 7-11
- Hydrolysis of protein
- Remove proteinaceous stains
- Inhibit redeposition of coagulated protein on fabric
- AMYLASES
- Remove starch based stains
- Used synergistically with proteases

- Alpha amylase digest alpha-1,4 linkage
- Produces soluble dextrins and oligosaccharides
- Termamyl,maxamyl
- LIPASES
- Remove Lipid stains
- Hydrophobic stains from cosmetics,oil based food

- CELLULASES
- Attack
- Fibric soft ending,Color brightening

Leather Tanning

- Salt cured dried hides are soaked in alkaline liquor to swell the skin
- The uptake of water and cleaning of hides is improved by addition of de-tergent proteinases
- Alcalase, Milenzyme, reverdase

- Enzymes need to be compatible with surfactants and oxidizing agents
- These are added to clean and prevent deterioration of hides
- Dehairing relies on dissolving the pro-teinaceous material binding
- Rapidermase = Dehairing of cow hides

- bating process = 7-9.5
- Batinase = mixture of pancreatic and Bacterial enzymes
- used to modify the matrix protein,ela-stin and keratin

Other Enzymes and Applications

- Cyclodextrin glycosyltransferase
- Convert starch to cyclodextrin
- 6-8 glycosylated units linked by alpha-1, 4 bond
- can form inclusion complexes with org. compounds

- Useful in food,cosmetics and pharma industry
- As a emulsifier or test modifier