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At termination of a glycerol fermentation

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DESCRIPTION

Glycerol has not been produced commercially by fermentation since world war 1. However, further studies within the period in-between have yielded additional potentially good yeast glycerol fermentations. At the time of warfare 1, the American "Eoff" process was developed, which utilized an alkaline fermentation reaction, pH 7 to eight provided by salt, to cause a Cannizzaro reaction for destruction of the acetaldehyde. Through a dismutation reaction caused by the alkali, two moles of acetaldehyde yielded one mole each of ethanol and carboxylic acid, thus preventing the acetaldehyde from serving as an electron acceptor. The Eoff process, however, was more vulnerable to contamination than the sulfite process thanks to the greater toxicity of the bisulfate of the sulfite process for contaminating microorganisms.

At termination of a glycerol fermentation, the glycerol is difficult to break away the fermentation broth and, therefore, in recent years several variations of the soluble sulfite process are developed in a trial to enhance this poor glycerol recovery picture. Thus, these fermentation procedures were designed to decrease or control the high concentrations of inorganic salts within the fermentation medium and, in each instance, a high inoculums level, within the range of 10 percent, with little cell proliferation during the fermentation was employed to combat bisulfate toxicity and also the poor energy yield to the cells caused by a scarcity of ATP formation. In one in every of these fermentation approaches, ammonium sulfite and ammonium bisulfate were employed in situ of sodium sulfite and , at termination of the fermentation, $Ca(OH)_2$ was added to precipitate salts, while ammonia et al volatile materials were removed by volatilization. In another procedure, calcium or magnesium sulfates, particularly magnesium sulfates, were employed. The relatively low solubility of those salts also provided less dissolved bisulfate within the medium, thus reducing bisulfate toxicity to the yeast.

A variation of the alkaline fermentation process bubbled air, nitrogen, or oxygen through the medium to get rid of ethanol, greenhouse emission, and acetaldehyde. This procedure was said to permit multiplication of the yeast cells, and a much better physiological condition for the calls. Also, the yeast cells could then be reused for fresh fermentations.

Theoretically, within the various yeast glycerol fermentations, approximately 1/2 the sugar should find yourself as glycerol and also the partner as fixed or decomposed aldehyde. In practice, however, the yields of glycerol are only 20to25 percent or slightly less supported sugar utilized, because the inhibition of the ethanol fermentation isn't complete so some ethanol and greenhouse gas are produced, and since the poor recovery picture for glycerol has not been improved.

Glycerol from bacillus subtilis

Bacillus subtilis is usually considered to be an aerobic micro-organism, although certain strains are facultatively aerobic. Aerobic growth of this organism on glucose yields glycerol, 2,3-butanediol, acetoin, ethanol, carboxylic acid, dioxide, and some other products. However, anaerobic growth, accomplished by bubbling nitrogen gas through the medium, provides glycerol and a pair of,3-butanediol because the main fermentation products without resort to acetaldehyde tie-up or destruction, and also the glycerol yields for this fermentation are reported to be kind of like those for the assorted yeast glycerol fermentations.