CALCIUM LACTATE PLANT FROM MOLASSES WITH FERMENTATION PROCESS

Name / NRP : Ninne Prabawesty (2306 030 044)
             Nanik Triyana (2306 030 058)
Department : D III of Chemical Engineering
Supervisor : Ir. Agung Subyakto, MS

Abstract
Calcium lactate are most widely used as lactic acid salts and numerous food applications, as an ingredient. It can be produced by fermentation of materials containing fermentable carbohydrate such as molasses and hydrolyzed starch from grains.

The calcium lactate plant is produce by fermentation of molasses through 3 steps. At the first step, the molasses is hydrolyzed by catalytic acid (H$_2$SO$_4$), into fructose and glucose. At the second step it is fermented by Lactobacillus delbrueckii to produce lactic acid at 50°C with pH 6 for 5 days and atmosphere condition. Then lactic acid is reacted by Ca(OH)$_2$ into calcium lactate. At the third step, the evaporation is required to find 50% of calcium lactate and the further purification is necessary to obtain 94.2% calcium lactate, 5% moisture, and 0.8% protein.

This plant is continuously operated for 330 day/year, at the capacity of 3316 kg/day. It requires 5363.594 kg/day of molasses as raw material and the supporting materials are 120.881 kg/day of malt sprout, 80.588 kg/day of (NH$_4$)$_2$HPO$_4$, 1062.288 kg/day of Ca(OH)$_2$, 5.071 kg/day of Lactobacillus delbrueckii and 0.091 kg/day of H$_2$SO$_4$. The required water are 159.6 m$^3$/day of sanitation, 520.487 m$^3$/day of cooling water, 8.176 m$^3$/day of boiler feed water, and 16.524 m$^3$/day of water process.

Key words: molasses, calcium lactate, Lactobacillus delbrueckii.