EQUILIBRIUM OF FURFURAL – WATER ON MANUFACTURING PROCESS OF FURFURAL FROM CORN COBS

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ABSTRACT

The use of corn cobs as raw materials on manufacturing furfural are very useful, because among others raw materials, corn cobs have the biggest pentosan content. When pentosans are hydrolized with an acid, it will form a compound called furfural.

The research target is equilibrium data of temperature to composition (T-x-y) on range of furfural’s composition from hydrolizing corn cobs with presence of sulfuric acid as catalyst by many variables.

The research of equilibrium of furfural-water on manufacturing process of furfural from corn cobs consists two process stage i.e. hydrolisation dan distillation. Pentosans within corn cobs are hydrolized with sulfuric acid catalyst (H₂SO₄) to form furfural. After the hydrolisation, then continue to distillation in order to get a maximum furfural purity. Distillation batch can be used to predict equilibrium data of temperature to composition (T-x-y).

Based on result of the research, it appears the highest furfural content from hydrolisation is 5,5625 mmol at temperature 100 °C by sulfuric acid concentration 8%. While comparison the result of research data from distillation to literature has error percentage 6,995 % to 11,088% for mass fraction of furfural liquid phase (x). And for fraction of furfural vapor phase (y) has error percentage 0,83% to 9,95%.

The benefits of this research are to give added value on corn cobs and contribution to fulfillment of domestic furfural needs.
Keywords: pentosan hydrolisation, batch distillation, furfural, corn cobs.