New Technology for Converting the Complex Carbohydrates in Corn Cobs into Simple Glucose that Can Be Used as a Source of Energy

Al Atiyat, Sarah

Abu Aisheh, Leen

High oil prices, growing concerns over climate change and pollution are diving investment and innovation in the biofuels sector.The interest was placed on the biomass sector such as agricultural residues like corncobs as a source for renewable energy with less harmful consequences and thus being environmentally friendly. Corncobs offer possibilities of energy production and the feasibility of corn cobs make them suitable for use as energy feedstock. What is our project? It acquires a simple title, however it has required extensive research and experimentation behind it; it tends to turn excess corncobs into energy through processing chemically and with the new addition of electricity through a unique electrical setup that is powered by simple photovoltaic cell. The unique design succeeded in converting 15.5 % of the mass of corn cobs into glucose at only 1.3 volt and 3.0 amperes. The hypothesis on which the research was based on was the ability of breaking the polar glycosidic linkage of carbohydrates using oppositely charged poles. Our research initiated with testing the existence of carbohydrates in corncobs using he traditional hydrolysis processes using acidic solutions which was able to convert 4% of the corn cobs mass into glucose.The experiments were developed and modified by using simple lab equipment to expose corncobs to oppositely charged poles. That caused the conversion of 8% of the corncobs mass into glucose. This led us to the final unique design that was mentioned previously.To test the existence of glucose, three tests were conducted: the first one was fermentation, the second was benedict test and the last one was sending a sample of the solution to a local laboratory. All of these tests depicted the existence of high percentage of glucose.

Awards Won: