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Data Article

Q1 Nano-cellulose based nano-coating biomaterial dataset using corn leaf biomass: An innovative biodegradable plant biomaterial

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ABSTRACT

The nanocellulose derived biodegradable plant biomaterial as nano-coating can be used in the medical, biomedical cosmetics, and bioengineering products. Bio-plastic and some synthetic derived materials are edible and naturally biodegradable. The study was conducted to investigate edible nano-biopolymer based nano-coating of capsules and drugs or other definite biomedical materials from corn leaf biomass. Corn leaf biomass was used as an innovative sample to produce edible nano-coating bioplastic for drug and capsule coating and other industrial uses. The data show the negligible water 0.01% absorbed by bio-plastic nanocoating. Odor represented by burning test was under the completely standard based on ASTM. Moreover, data on color coating, tensile strength, pH, cellulose content have been shown under standard value of ASTM (American standard for testing and materials) standard. In addition to that data on the chemical element test like $K+$, CO_3^{-}, Cl^{-} $Na+$ exhibited positive data compared to the synthetic plastic in the laboratory using the EN (166)) standardization. Therefore, it can be concluded that both organic (cellulose and starch) based edible nano-coating bioplastic may be used for drug and capsule coating as biomedical and medical components in the pharmaceutical industries.

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Specification Table

Subject area	Biological chemistry, Biochemistry
More specific subject area	Nanocellulose based nanocoating from plant biomass
Type of data	Physicochemical (Table and Figure)
How data were acquired	SEM, pH meter, spectrophotometer, Tensile test was performed by Universal Test Machine, absorption test, burning test, crack test, energy test, chemical test by ASTM and EN standard.
Data format	Row data were collected and analyzed
Experimental factors	Single factor
Experimental features	Three replicates were used in the experiment as Complete Randomized Design (CRD). The sample was selected randomly from the different lots. Standard deviation and standard error was analyzed.
Data source location	Kuala Lumpur, Malaysia and Hail, KSA.
Data accessibility	This is an innovative data, not yet published elsewhere.

Value of the Data

1. Data represented are a superlative and an innovative research based work. Data would be a valuable to the researcher those who are doing research on nano-coating production utilizing biomass as plant biomaterial.
2. Data having innovative information on nano-coating for drug and capsule or other definite biomaterials from corn leaf biomass have been explored.
3. Data identify the suitability of nano-cellulose based nano-coating plant biomaterial production using leaf biomass according to the ASTM (American standard for testing and materials) and EN (European Norms) standardization.
4. Data would be highlighted for future studies in the related research community all over the world.

1. Data

Fig. 1 shows the nano-coating production procedure from corn leaf biomass. The data exhibit the nanosized particle (30 nm) as nanocellulose detected by Transmission Electron Microscopy (TEM) (Fig. 2). From the data (Table 1), it has been seen that negligible water 0.01% was absorbed by nanocoating bio-plastic.

In Table 2, data observe the odor represented by burning test was under completely standard of burning test. Data on the color coating time for drying were 1.2 h (Table 3). Table 4 shows the tensile strength 73.0 MPa/kg m^3 and tensile modulus 1.01 GPa for the nano-coating bioplastic. Moreover, data shown in Table 5 of pH and cellulose and exhibited positive value. The data of chemical element test like K+, CO_3^{--}, Cl^-, Na+ were measured and represented positive data compared to the synthetic plastic in the laboratory using the EN (166)) standardization (Table 6).

2. Experimental design, materials and methods

2.1. Sample collection and preparation

Five kg corn stalk new leaves were collected from the farmers field, Kuala Lumpur Malaysia and Hail regional area, KSA. Leaves were randomly chosen from both area and removed from corn stalk

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