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Cellulose based bioplastic for biodegradable packaging material

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Lack of the biodegradable property has made the plastic material is one of the most alarming environmental threat now a days. Worldwide, billions of used plastic bags are disposing to the environment every day from which a very few can be recycled. Most of the bags end up as a blockage or sedimentation of the water bodies, soil as well as contaminants of the sea. 410 million poly-bags are used in only Dhaka city per month and more than 3 meters layer are formed in the base mate of the Buriganga River. Moreover, the manufacturing of plastic bags contributes to the diminishing availability of our natural resources and the damage to the environment from the extraction of petroleum as they are made from non-renewable natural resource: petroleum. In these regards plastic bags failed to meet up the primary criteria of the sustainable development and thus development of new generation biodegradable packaging material is must which should be biodegradable without compromising most of the good properties of the plastic bags. Moreover it should be affordable to the mass population. In order to meet the packaging needs of today without compromising the ability

of future generations to meet those needs, new generation biodegradable and sustainable packaging material from jute based cellulose has been developed. At first, low cost water soluble cellulose was prepared from jute fiber waste and polymer blend was formulated with water soluble polymer, crosslinker and a plasticizer. The formulated solution was subjected to solution casting for preparing biodegradable sheets for packaging purposes. Biodegradation studies revealed that the developed sample undergoes biodegradation within 180 days in soil and within 9 hours in water. Physical, mechanical and morphological properties of the developed biodegradable packaging revealed similar mechanical properties but less water resistance compared to polyethylene sheet. Moreover the sample showed similar transparency compared to the polyethylene sheet. Considering these tests and characterization it has become evident that the optimized blend film will be very suitable as a low cost, environment friendly biodegradable packaging materia

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