ABSTRACT

In the present world, increasing volumes of plastics are manufactured and used for various applications because of their versatility and ability to be mass produced. However, they usually not decomposing, and they are considered to cause some environmental problems. Currently, almost all the polymers used do not physically decompose due to their high chemical stability, leading to the serious environmental problem. Now a day there is an emerging interest in replacing non-renewable additives with biodegradable compounds. Cellulose plays a very important role in this modification. Their low-cost and low density associated with high specific mechanical properties represent a good renewable and biodegradable alternative to the most commonly used synthetic reinforcement.

In this work, cellulose is modified by using 2-(Triflurомethyl)benzoylchloride by base catalyzed reaction. Modification of cellulose was confirmed by solubility and IR studies. The biodegradable composite films were developed by film casting method using modified cellulose with Poly (lactic acid); modified cellulose with Poly (vinyl alcohol); modified cellulose with Polypyrrolidone in different compositions.

The hybrid biodegradable composite films were developed by film casting method using modified cellulose with Poly(vinyl alcohol) and Poly(lactic acid); modified cellulose with Poly(vinyl alcohol) and Polypyrrolidone in different compositions.

Then cellulose was modified by using 2-fluoro benzoylchloride by base catalyzed reaction. By using this modified cellulose with Poly (vinyl alcohol) and Poly (lactic acid) hybrid biodegradable composite films were developed in different compositions.

The film composites were characterized by mechanical, moisture absorption, oxygen permeability, water vapour permeability and biodegradable properties. The main conclusion from this work is that modified cellulose fibers can also be used to

enhance the barrier properties of biocomposites of interest, for instance, packaging and membrane applications.

The films obtained were shown to be flexible, displayed better mechanical properties and biodegradability. Moisture absorption test showed that addition of modified cellulose is an effective way of decreasing its sensitivity to moisture and improving mechanical properties. This indicates the importance of modified cellulose as a reinforcing agent. After evaluating these properties of film composites, I came to the conclusion that, these bio composites can be use to membrane and packaging applications.