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UV Laser based Local Fluorination of Polymer.

ABSTRACT - Masterthesis

Light amplification by stimulated emission of radiation, also known as LASER is used in many applications in the day-to-day modern life. Laser is a monochromatic, coherent and directional radiation. In this thesis, an Ultraviolet Laser i.e., UV laser is used.

Polymers are long chain molecules of high molecular weight, known also as 'macromolecules', which are bonded with covalent bonds to create the long-chain. A single unit, monomers are repeated to make these polymers.

Polymers very often do not possess the surface properties needed such as adhesion, chemical composition, hydrophobicity, hydrophilicity, roughness conductivity and etc. However, they have excellent bulk physical and chemical properties, are inexpensive, and are easy to process. Polymers are widespread materials for many applications due to their superior physical and chemical properties, especially wettability, weathering and inhibition of carbohydrate diffusion. For these reasons surface modification techniques that can transform these inexpensive materials into valuable finished products have become an important part of plastic industries.

One of the techniques used to achieve required changes in polymer is fluorination. Fluorine, which has an electronegativity of 4.0, is one of the most reactive elements in the periodic table of the elements. Therefore, it reacts with almost any inorganic and organic compounds even at standard room temperature.

When the polymer is fluorinated its surface energy is changed. Which in turn changes the hydrophobic characteristics of the polymer. If the contact angle of the liquid on the surface is increased, then it can find application in protective clothing, stain-proof textiles, medical implants, marine coatings and microelectronics.