

Bio/Chemical Sensors by Plasma Polymers

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In the post half of the 20 th century, the interest in the development of electric sensing devices, called sensors, has considerably increased. In the initial stages, sensors were generally made up of inorganic materials. The essentiality to use sensors in the microelectronics industry, gave birth to micro-sensors and have got considerable attention due to its diversity in application fields such as, medicine, biology, safety, environmental protection etc. Recent spurt in the polymer sensors compared to inorganic sensors has been the result of current trends in the micro electronics industry and materials research fields, to replace brittle metallic components with flexible polymer materials in the electronic circuits. The great variety of properties that can be altered and controlled with different additives in polymers, enhances their application for various sensing purposes. Nowadays plasma polymers are in the main focus of the research field of polymer sensors due to their stable properties, such as excellent thermal stability, strong adhesion to a wide range of metal substrates, an outstanding chemical resistance to aggressive environment – organic solvents, acids and alkalis compared to conventional polymers. Furthermore, by varying different plasma parameters it is possible to modify the chemical composition and structure of polymers for obtaining thin films with acceptable physical properties, such as the ability to adsorb different gas molecules and enzymes. Coupled with above mentioned properties, the flexibility to use the plasma polymerization method in micro electronics industry, gives the importance of the plasma polymer sensors in the application oriented research field. Recent development in the plasma polymerization field to adopt pulsed plasmas to deposit plasma polymers while retaining the chemical structures of the monomers, gives a bright future of this method in the field of Bio/Chemical sensors.