Abstract

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Compo-SiL® skin substrates as a biocompatible, sustainable and flexible platform for Biosensors.

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Abstract

Biosensors are nowadays omnipresent in medical analysis along with their present in other areas like daily healthcare monitoring, food safety and control, drug delivery systems, wound healing, human physiological signal monitoring and ongoing medical research [1-2]. The global pandemic COVID-19 and it's worldwide social and human life destruction has shown us, how remote heath care monitoring, digitally health management, physiological signal monitoring etc. are the burning needs of the hour. For the accuracy and comfort of the patient for disease diagnosis, monitoring and treatment, it's very essential to have a flexible, sensitive, robust, conformable, portable and bio-compatible platform to design the flexible hybrid electronics for bio sensing. It's also important to rethink and design the rapidly emerging printed and flexible E-skin electronics on a sustainable novel material as well as circular platform that will minimize E-waste and GSG emissions at the very beginning stage of innovation. According to the sustainability profile and life cycle of silicone materials, it is one of the more circular and sustainable material which can be used as a substitute for non-plastic version. For acting as an ideal interface for human skin, the essential chemical and mechanical characteristic features of siloxanes like chemical inertness, free rotation of the chain and amphiphiilic nature are the most important factor to enable the formation of conformable hydrogen bonds with human skin. Realizing this utmost importance and solving the long-time key problem of surface inertia for printing on silicone, General Silicones has developed roll-to-roll Compo-SiL® Skin substrates, a low modulus trilayer thin structure mimicking the human skin [3-6]. Thus, due to its low mechanical stiffness and enough stretch ability to accommodate during natural body motion, Compo-SiL® roll to roll skin substrates could be a promising sustainable platform for biosensors in the healthcare industry as well as wearable E-skin electronics.

Biography

Dr. Anupam Mukherjee has a multidisciplinary background of achievements in synthetic organic chemistry, material science for optoelectronic applications and silicone materials & technology and its production and diverse applications. Currently, in General Silicones as Technical Director of R&D Center, he is engaged in corporate entrepreneurship to develop new ideas and opportunities within established business and carrying out investigations on design and development of various innovative large-scale manufacturing of high value- added silicone products following multi manufacturing processes.