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Abstract

Silicon Carbide for Advanced In-Vivo Medical Devices †

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Abstract: Silicon Carbide (SiC) is a highly versatile semiconductor material that has long been used in harsh applications such as space, corrosive and high-temperature environments and, more recently, the human body. The impressive and highly advantageous materials properties of SiC have shown that this material is ideally suited for medical applications due to its proven bio- and hemocompatibility. Indeed, SiC appears to be quite unique for use in the human brain whereby implants made using SiC coatings have demonstrated vastly improved performance with virtually no human body immune response which plagues Silicon technology. After over two decades of focused research and development SiC is now ready for use in the healthcare sector and this paper provides an up to date assessment of SiC devices for long-term human use. First the plethora of applications that SiC is uniquely positioned for in human healthcare is reviewed so that healthcare professionals will be fully aware of the significant opportunities now possible with the rapid development of this technology. Next progress in two areas will be presented: Neural implants and deep-tissue cancer therapy using SiC nanotechnology.

Keywords: SiC; devices; medical; neural implants; cancer therapy

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