Silicon carbide on polyimide as a promising platform towards the development of multi-environmental monitor systems

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Flexible and stretchable electronics have advanced rapidly in the last decade, with applications covering a broad range of fields including energy, automotive, and healthcare industries. Flexible electronics also offer interesting features for harsh environments such as light-weight (e.g. for space exploration), the ease of installation (e.g. on curved surfaces), and 3-dimension data mapping (e.g. in marine sensors and implantable sensors).[1]

A good candidate material for harsh environments is silicon carbide (SiC), which exhibits superior physical and chemical properties over silicon material.[2] Nevertheless, implementation of SiC into flexible electronics for extreme operating conditions has been a great challenge due to the high deposition-temperature of above 1000℃, which exceeds the melting points of most polymers.

This work presents our recent findings on the development and characterization of silicon carbide-on-polymer as a new platform for flexible electronics.[3] This new platform provides novel features such as long-term stability in fluidic environments and the capability of operating over 400℃, opening new opportunities in bendable, foldable and stretchable electronics operating under extreme conditions.

References

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