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HETEROSTRUCTURE ELECTROLUMINESCENT SILICON-BASED WITH GRAPHENE

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Heterostructure based on silicon with emission of white electroluminescence (EL) are reported in this work, these heterostructures of porous silicon (PSi), graphene oxide (GO), silicon-rich-oxide (SRO) thin films and zinc oxide (ZnO) as a transparent conductor oxide (contact). The white EL emission is corroborated with the EL spectra that they are very broad (from 400 to 750 nm) and is attributed to the presence of the different nanostructured materials that make up the heterostructures. The devices exhibited EL only in negative bias and by the I-V curves we deduced that the dominant carrier conduction mechanism in the region where the EL takes place is the space-charge limited current conduction mechanism. The electroluminescence exhibited by these devices starts at a current of 1.1 μA and is full area electroluminescent at approximately 3 μA reaches its maximum value at 9 μA. Finally, we demonstrated that it is possible the fabrication of LEDs on a c-Si substrate.

References

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