SUMMARY

[0006] In a first aspect, the present disclosure provides a method for manufacturing a porous graphene layer across a precursor material on a substrate, the method comprising of: determining a first temperature threshold and a second temperature threshold, the first temperature threshold being a minimum temperature required for forming the porous graphene layer from a precursor material layer on a portion of the substrate, the second temperature threshold being one at which the substrate is likely to experience thermal damages above this temperature threshold; determining at least one of operating parameters of a light source, wherein exposing the precursor material layer to the light source that is operating under the at least one of the operating parameters causes a temperature of the portion of the substrate adjoining a side of the precursor material layer to maintain below the second temperature threshold and a temperature of the opposite side of the precursor material layer to rise above the first temperature threshold; and generating a beam of light from the light source to the precursor material layer based on the at least one of operating parameters of the light source to form the porous graphene layer.

[0007] In a second aspect, the present disclosure provides an apparatus for manufacturing a porous graphene layer across a precursor material layer on a substrate, the apparatus comprising: at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code configured to, with at least one processor, cause the apparatus at least to: determine a first temperature threshold and a second temperature threshold, the first temperature threshold being a minimum temperature required for a precursor material layer on a portion of the substrate to form the porous graphene layer, the second temperature threshold being one at which the substrate is likely to experience thermal damages above this temperature threshold; determine at least one of operating parameters of a light source, wherein exposing the precursor material layer to the light source that is operating under the at least one of the operating parameters cause a temperature of the portion of the substrate adjoining a side of the precursor material layer to maintain below the second temperature threshold and a temperature of the opposite side of the precursor layer to rise above the first temperature threshold; and generate a beam of light from the light source to the precursor material layer based on

the at least one of operating parameters of the light source to form the porous graphene layer.

[0008] In a third aspect, the present disclosure provides an electronic device comprising at least one porous graphene layer across a precursor material layer on a substrate according to the first aspect.

[0009] In a fourth aspect, the present disclosure provides a film comprising a substrate and at least one porous graphene layer across a precursor material layer on the substrate according to the first aspect.