SUMMARY

According to ~~some embodiments~~ a first aspect, there is provided an apparatus ~~includes~~ comprising a circuit board made of polycrystalline diamond. The circuit board is formed by deposition of layers of poly(hydridocarbyne). Each layer has the geometry of a cross section of the circuit board. The circuit board is further formed by pyrolysis of the layers of poly(hydridocarbyne) at a temperature greater than or equal to 100 degrees Celsius and less than or equal to 800 degrees Celsius. The apparatus additionally includes a plurality of tubes formed within the circuit board. The tubes have a plurality of terminations at one or more surfaces of the circuit board. Each tube comprises a layer of graphene that is operable to permit each tube to conduct electrical current. Each layer of graphene is formed by thermolysis of the polycrystalline diamond circuit board at a temperature greater than or equal to 900 degrees Celsius. Each tube is substantially hollow each layer of graphene forms an outer surface of the respective tube.

According to a second aspect, there is provided an apparatus comprising a circuit board made of polycrystalline diamond; and a tube formed within the circuit board, the tube terminating at one or more surfaces of the circuit board, the tube comprising a layer of graphene that is operable to permit the tube to conduct electrical current.

According to a third aspect, there is provided a method comprising utilizing a three-dimensional (3D) printer to deposit a pre-ceramic polymer in a pattern of a printed wiring board (PWB) that comprises a plurality of tubes arranged within the PWB; heating the plurality of layers of the deposited pattern of pre-ceramic polymer to a first temperature to form the PWB, the PWB being formed of polycrystalline diamond after the heating of the deposited pattern of pre-ceramic polymer to the first temperature; and heating the PWB to a second temperature until graphene forms on surfaces of the tubes within the PWB.

Technical advantages of certain embodiments may include using a diamond forming pre-ceramic polymer in a 3-D printer to form a diamond object. Some embodiments may provide methods of forming an object by depositing layers of multiple types of pre-ceramic polymers. Additional technical advantages of some embodiments may include formation of a circuit board composed primarily of polycrystalline diamond. Other technical advantages will be readily apparent to one skilled in the art from the following figures, descriptions, and claims. Moreover, while specific advantages have been enumerated above, various embodiments may include all, some, or none of the enumerated advantages.