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(54) Title: METHOD FOR GROWING MONOCRYSTALLINE DIAMONDS



FIGURE 6

(57) Abstract: A method of forming mono-crystalline diamond by chemical vapour deposition, the method comprising the steps of: (a) providing at least one diamond seed; (b) exposing the seed to conditions for growing diamond by chemical vapour deposition, including supplying reaction gases that include a carbon- containing gas and hydrogen for growing diamond and include a nitrogen-containing gas; and (c) controlling the quantity of nitrogen-containing gas relative to other gases in the reaction gases such that diamond is caused to grow by step-growth with defect free steps without inclusions. The nitrogen is present in the range of 0.0001 to 0.02 vol %. Diborane can also be present in a range of from 0.00002 to 0.002 vol %. The carbon-containing gas can be methane.

WO 2009/154577 A1