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### Abstract of the Disclosure

#### A Method for Forming A Material Layer in a Semiconductor Device Using Liquid Phase Deposition

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A material layer is deposited by liquid-phase thermal decomposition of a metal-organic precursor dissolved in an anhydrous organic solvent. The organic solvent has a chemical polarity corresponding to the metal-organic precursor and has a normal boiling point above the decomposition temperature of a selected precursor. The present invention enables use of a wide variety of molecular compositions which can be used for the formation of an equally wide variety of material layers. In one embodiment of the invention, a semiconductor substrate (12) is subjected to a liquid mixture comprising a metal-substituted heterocyclic acetylacetonate precursor dissolved in tetradecane (b.p. 254°C). Depending upon the structure of the acetylacetonate, either a metal or a metal oxide film is deposited in the liquid phase on a semiconductor substrate (12) immersed in a solution which is maintained at the decomposition temperature of the acetylacetonate precursor.

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FIGURE accompanies this abstract.