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(54) Title: LOW TEMPERATURE MOLYBDENUM DEPOSITION ASSISTED BY SILICON-CONTAINING REACTANTS

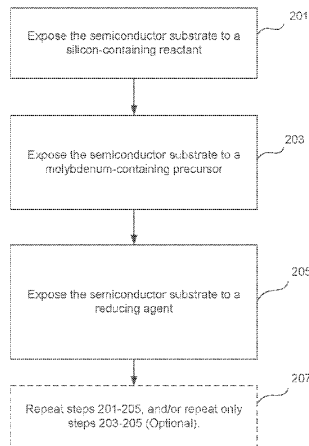


Figure 2A

(57) Abstract: Molybdenum-containing films are deposited on semiconductor substrates at relatively low temperatures of between about 100 and about 500 °C, such as between about 200 and about 450 °C. For example, molybdenum metal can be deposited at this temperature on a substrate having exposed metal and exposed dielectric in a substantially non-selective manner. In one implementation, a substrate having a recessed feature is provided, where the recessed feature has an exposed dielectric on the sidewalls and an exposed metal on the bottom. The substrate is exposed to a molybdenum-containing precursor, a reducing agent, and a silicon-containing reagent, to thereby reduce the molybdenum-containing precursor and form a molybdenum-containing layer that includes metallic molybdenum. The use of the silicon-containing reactant leads to a reduction in on-metal/on-dielectric selectivity of molybdenum deposition.

[Continued on next page]

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