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(54) Title: ATOMIC LAYER DEPOSITION WITH INHIBITION AND IN-SITU PASSIVATION, AND HARDMASK PROTECTION DURING ETCHING OF A GAPFILL FILM

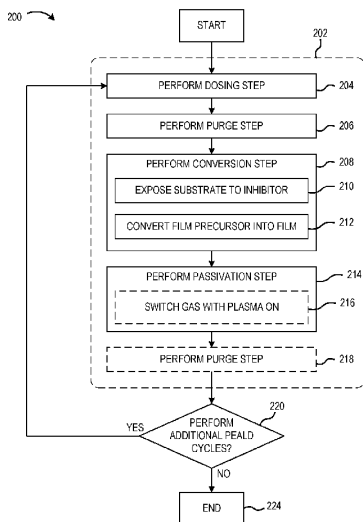


FIG. 2

(57) Abstract: Examples are disclosed that relate to performing plasma-enhanced atomic layer deposition (PEALD) with in-situ passivation, and to protecting a hardmask when performing etching of a gapfill film. One example provides a method including performing a plurality of PEALD cycles to deposit a film into the gap. Each PEALD cycle comprises introducing a film precursor into a processing chamber to adsorb the film precursor to surfaces within the gap, and then purging the chamber. The PEALD cycle further comprises, in a conversion step, forming a plasma using a gas mixture comprising a reactant and an inhibitor to expose the substrate to the inhibitor and convert the film precursor into a film within the gap. The PEALD cycle further comprises, after the conversion step, in a passivation step, exposing the substrate to a plasma comprising a passivation agent to remove at least some of the inhibitor from the surfaces in the gap.

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