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(54) Title: HIGH STEP COVERAGE TUNGSTEN DEPOSITION

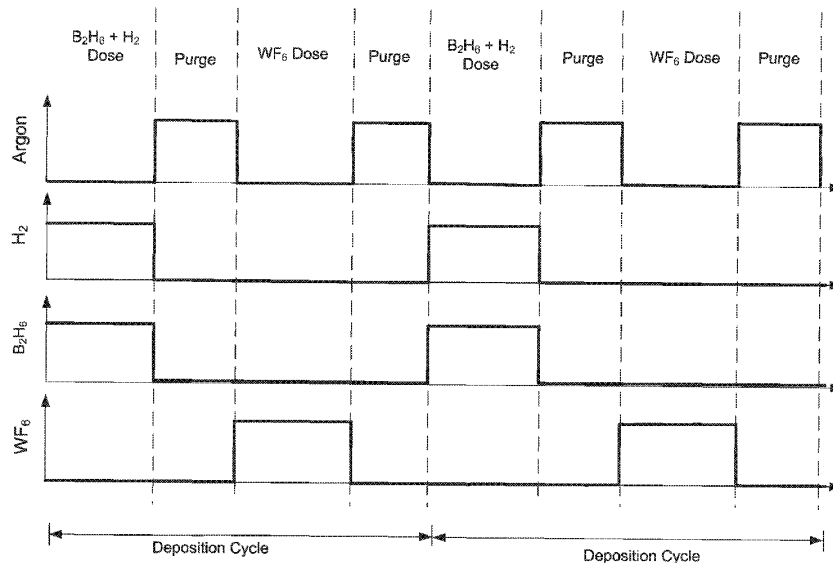


FIG. 2

(57) Abstract: Methods of depositing a tungsten nucleation layers that achieve very good step coverage are provided. The methods involve a sequence of alternating pulses of a tungsten-containing precursor and a boron-containing reducing agent, while co-flowing hydrogen (H2) with the boron-containing reducing agent. The H2 flow is stopped prior to the tungsten-containing precursor flow. By co-flowing H2 with the boron-containing reducing agent but not with the tungsten-containing precursor flow, a parasitic CVD component is reduced, resulting in a more self-limiting process. This in turn improves step coverage and conformality of the nucleation layer. Related apparatuses are also provided.

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