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(54) Title: TUNGSTEN DEPOSITION

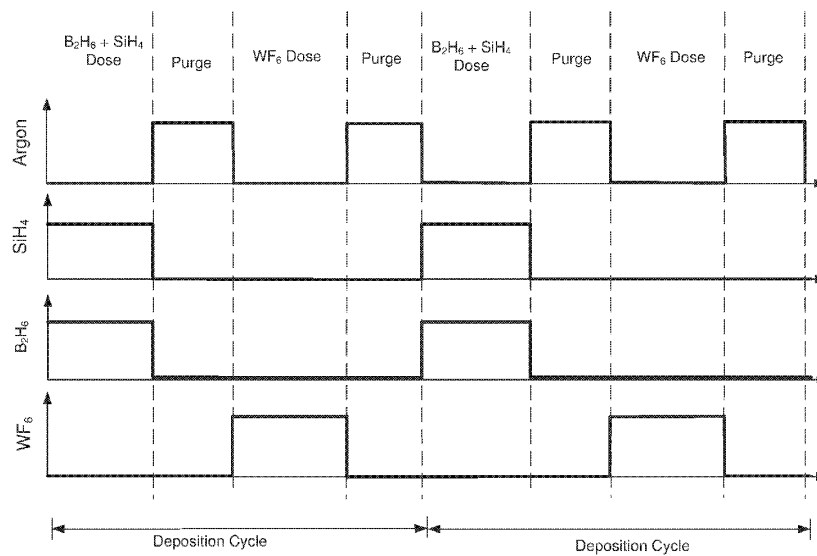


FIG. 2A

(57) Abstract: Described herein are methods of filling features with tungsten and related apparatus. The methods described herein involve deposition of a tungsten nucleation layer prior to deposition of a bulk layer. The methods involve multiple atomic layer deposition (ALD) cycles. According to various embodiments, both a boron-containing reducing agent and silicon-reducing agent may be pulses during a single cycle to react with a tungsten-containing precursor and form a tungsten film.

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