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(54) Title: METHOD AND ARRANGEMENT FOR FORMING A TRANSITION METAL DICHALCOGENIDE LAYER

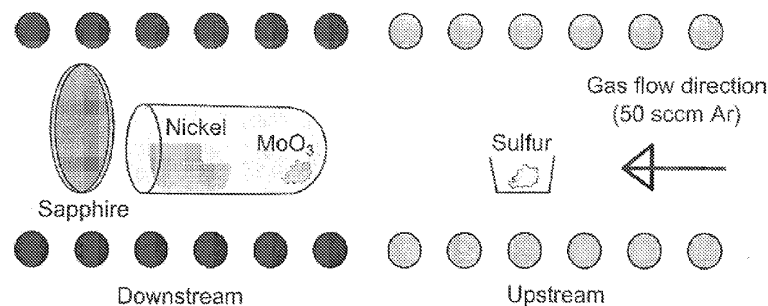


FIG. 1A

(57) Abstract: A method of forming a transition metal dichalcogenide layer on a substrate is provided. The method may include providing a transition metal oxide, a chalcogen source, a non-gaseous chalcogen scavenger, and a substrate, wherein the substrate is disposed downstream of the transition metal oxide and the chalcogen source, and wherein the non-gaseous chalcogen scavenger is disposed in proximity to the transition metal oxide; generating vapors of the transition metal oxide and vapors of the chalcogen source, wherein the non-gaseous chalcogen scavenger reacts preferentially with the vapors of the chalcogen source; disposing the vapors generated from the transition metal oxide and the chalcogen source on the substrate; and reacting the vapors of the transition metal oxide and the chalcogen source on the substrate to obtain the transition metal dichalcogenide layer on the substrate. In one embodiment, the transition metal oxide is molybdenum trioxide (MoO_3), the chalcogen source is sulfur, the non-gaseous chalcogen scavenger is nickel and the transition metal dichalcogenide is molybdenum disulfide (MoS_2). An arrangement for forming a transition metal dichalcogenide layer on a substrate is also provided.

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