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(54) Title: METHODS FOR MAKING SILICON AND NITROGEN CONTAINING FILMS

(57) Abstract: A method for forming a silicon nitride film that may be carbon doped via a plasma ALD process includes introducing a substrate into a reactor, which is heated to up to about 600°C. At least one silicon precursor as defined herein and having one or two Si-C-Si linkages is introduced to form a chemisorbed film on the substrate. The reactor is then purged of any unconsumed precursors and/or reaction by-products with a suitable inert gas. A plasma comprising nitrogen is introduced into the reactor to react with the chemisorbed film to form the silicon nitride film that may be carbon doped. The reactor is again purged of any reaction by-products with a suitable inert gas. The steps are repeated as necessary to bring the deposited silicon nitride film that may be carbon doped to a predetermined thickness.



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