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(54) Title: PRECURSORS AND PROCESSES FOR DEPOSITION OF SI-CONTAINING FILMS USING ALD AT TEMPERATURE OF 550°C OR HIGHER

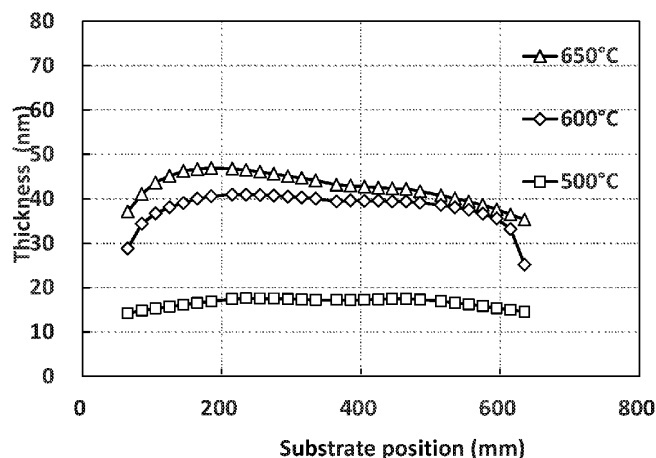


FIG. 6

(57) Abstract: Methods for forming a Si-containing film on a substrate comprise heating the substrate to a temperature higher than 550°C, exposing the substrate to a vapor including a Si-containing film forming composition containing a Si-containing precursor having the formula: $\text{SiR}^1_y\text{R}^2_{4-x-y}(\text{NH-SiR}^3)_x$, wherein $x=2, 3, 4$; $y=0, 1, 2$, R^1 and R^2 each are independently selected from H, a halogen (Cl, Br, I), an $\text{C}_1\text{-C}_4$ alkyl, an isocyanate, a $\text{C}_1\text{-C}_4$ alkoxide, or an $\text{-NR}^3\text{R}^4$ group in which R^3 and R^4 each are independently selected from H, a $\text{C}_1\text{-C}_4$ alkyl, provided that if $\text{R}^3=\text{H}$, $\text{R}^4>\text{C}_1$; each R^1 is independently selected from H, a halogen (Cl, Br, I), or a $\text{C}_1\text{-C}_4$ alkyl, and depositing the Si-containing precursor onto the substrate to form the Si-containing film on the substrate through an ALD process. The Si-containing precursor may be selected from $\text{SiH}_2(\text{NH-Si}(\text{CH}_3)_3)_2$, $\text{SiHCl}(\text{NH-Si}(\text{CH}_3)_3)_2$, $\text{SiCl}_2(\text{NH-Si}(\text{CH}_3)_3)_2$, $\text{SiH}(\text{NH-Si}(\text{CH}_3)_3)_3$, $\text{SiCl}(\text{NH-Si}(\text{CH}_3)_3)_3$, or $\text{Si}(\text{NH-Si}(\text{CH}_3)_3)_4$.

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