High-temperature hollow cathode plasma enhanced atomic layer deposition of silicon nitride (SiN_x) thin films using hexachlorodisilane (HCDS)

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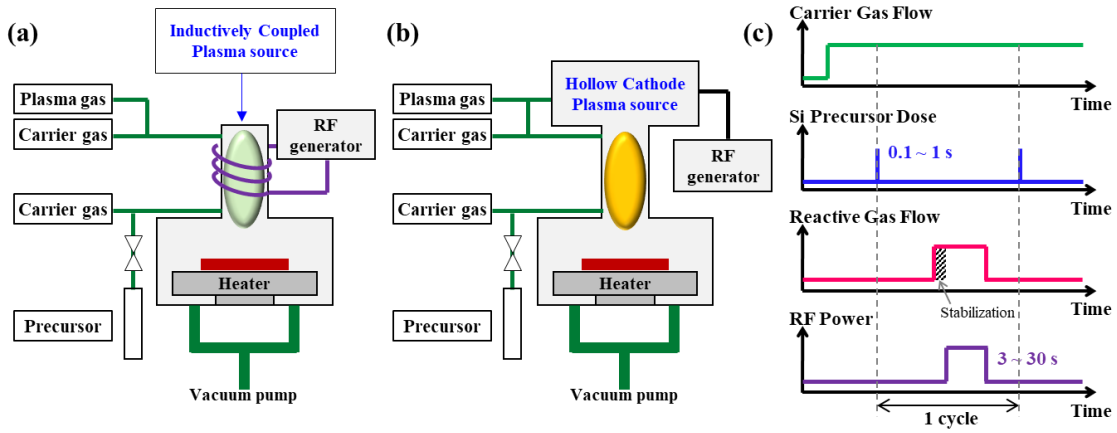
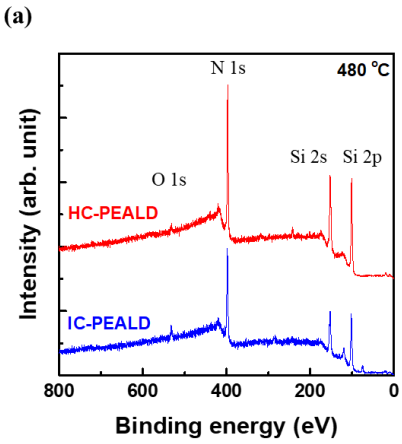


Figure 1. Schematic of (a) IC-PEALD system, (b) HC-PEALD system, and (c) representative time sequence of PEALD SiN_x process



(b)

	ICP	HCP
[Si] at. %	38.2	43.4
[N] at. %	54.4	53.2
[O] at. %	7.4	3.4
[Cl] at. %	< d.l.	< d.l.
[C] at. %	< d.l.	< d.l.

Figure 2. (a) XPS survey scan PEALD-SiN_x films at different plasma source and (b) Elemental composition calculated from XPS spectra

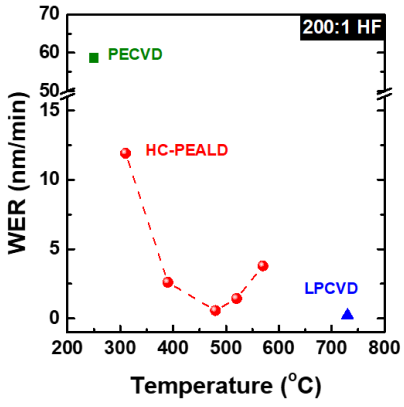


Figure 3. Wet etch rate of different silicon nitride films in a diluted 200:1 HF solution.