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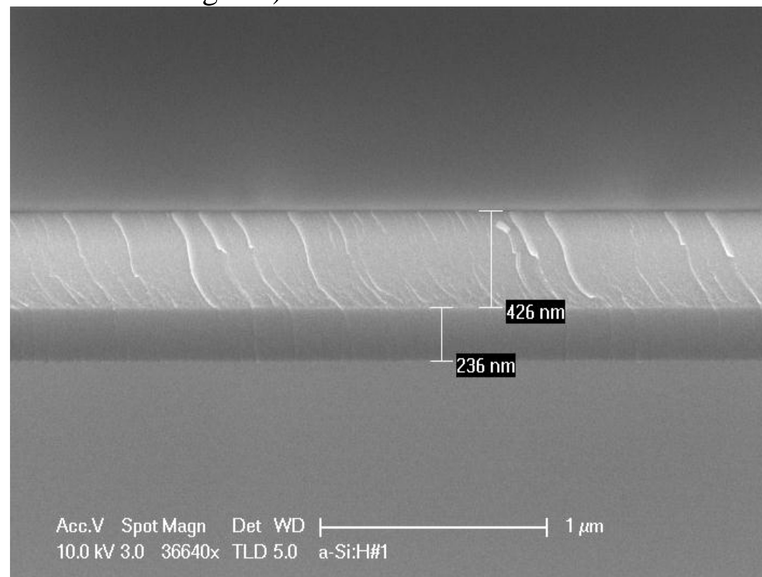
a-Si:H Film, Grown using Unaxis ICP Deposition Tool, at Substrate Temperature of 90 °C*							
Pressure (mT)	Bias Power (W)	ICP Power (W)	Gas Flow Rate (sccm)		Deposition Rate (nm/min.)	Stress (MPa)**	Integrated Area under Stretching Mode (cm^{-1})***
			SiH_4 (100%)	Ar			
1.5	50	400	40	20	85.2	-676	6.19
1.5	50	400	10	20	17	-144	4.57
1.5	50	800	10	20	20.3	N/A	N/A

*: Using 5 mT, 100 W Bias Power in Plasma Ignition Step.

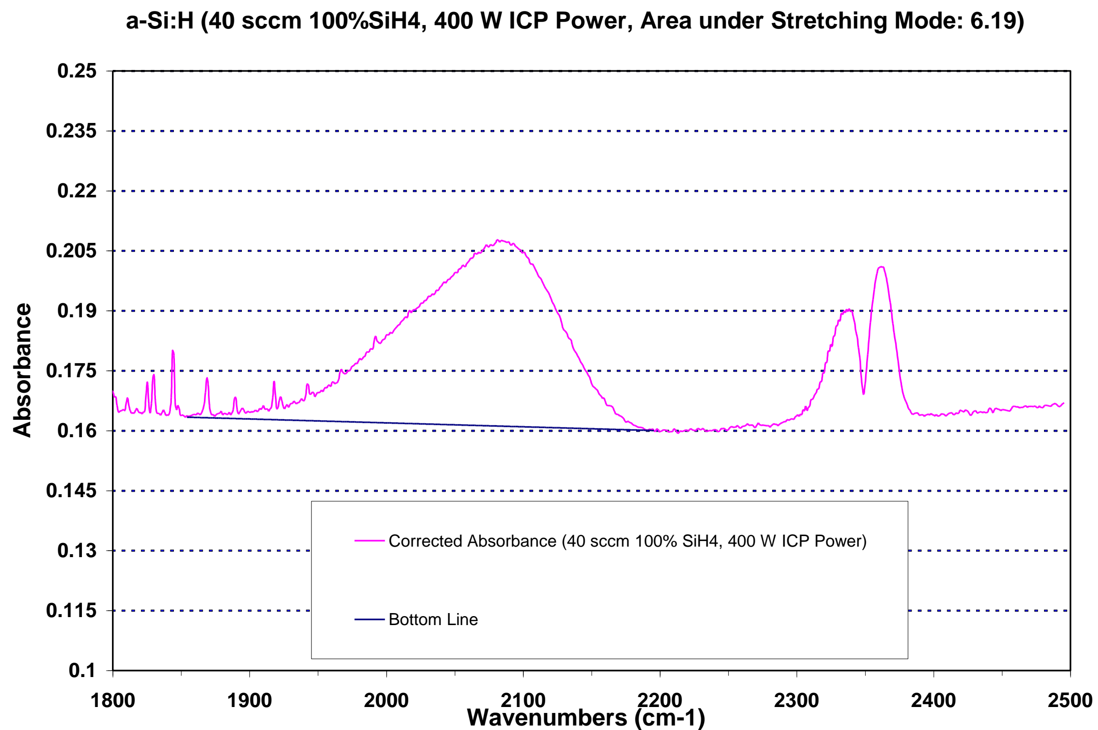
**: Negative sign means a compressive stress.

***: This integrated area under the Si-H stretching mode is proportional to the Hydrogen content in the film.

Figure 1 a) SEM picture of Film#1 with a growth condition of 1.5 mT, 50/400 bias/ICP Powers, and 40/20 sccm SiH_4(100%)/Ar flow rate (the film was grown on a layer of SiO_2, which itself was deposited on a Si substrate); b) FTIR Absorption Spectrum (the mode peaked at ~2100 cm^{-1} is the Si-H Stretching one).



(a)



(b)

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Figure 2 FTIR Absorption Spectrum of Film#2 with a growth condition of 1.5 mT, 50/400 bias/ICP Powers, and 10/20 sccm SiH_4(100%)/Ar flow rate (the mode peaked at ~2100 cm^{-1} is the Si-H Stretching one).

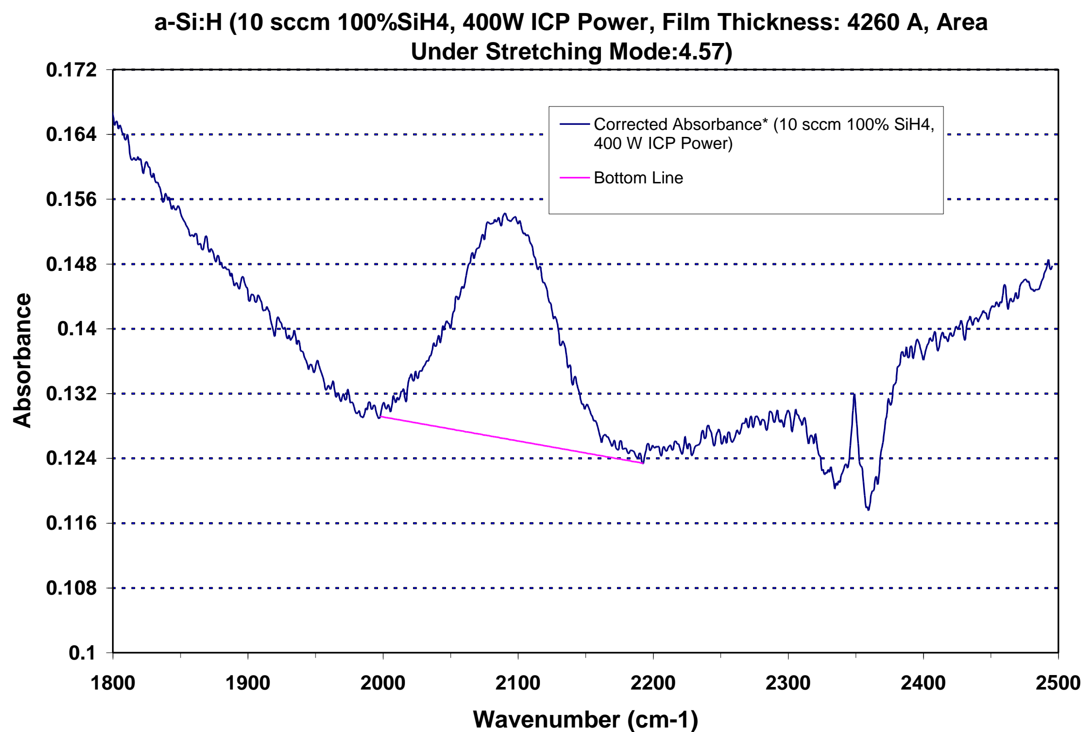
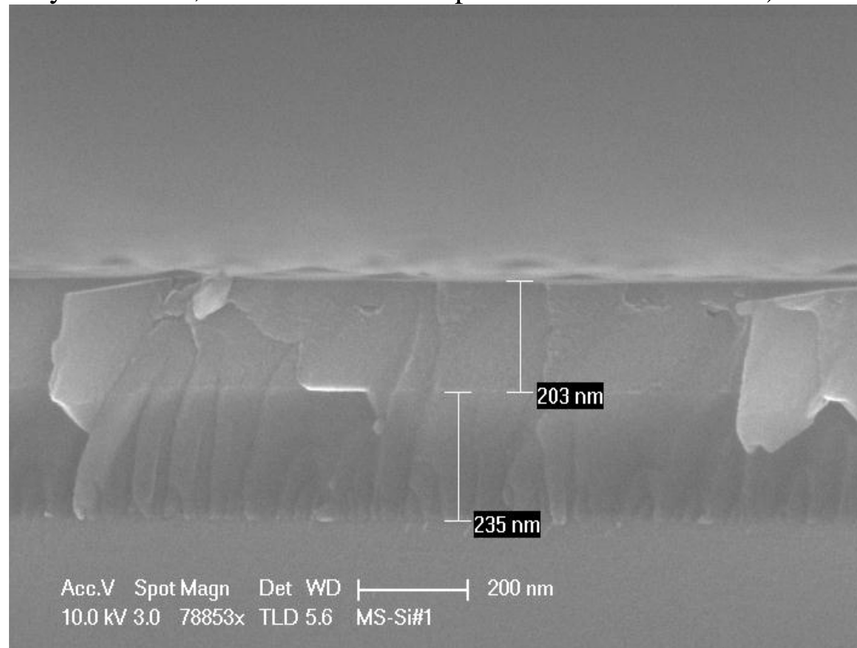


Figure 3 SEM picture of Film#3 with a growth condition of 1.5 mT, 50/800 bias/ICP Powers, and 10/20 sccm SiH_4(100%)/Ar flow rate (the film was grown on a layer of SiO_2, which itself was deposited on a Si substrate).



Conclusion: The growth rate of a-Si film is proportional to the SiH_4 (100%) gas flow rate. The higher the film growth rate, the higher the compressive stress and the hydrogen concentration in the film.