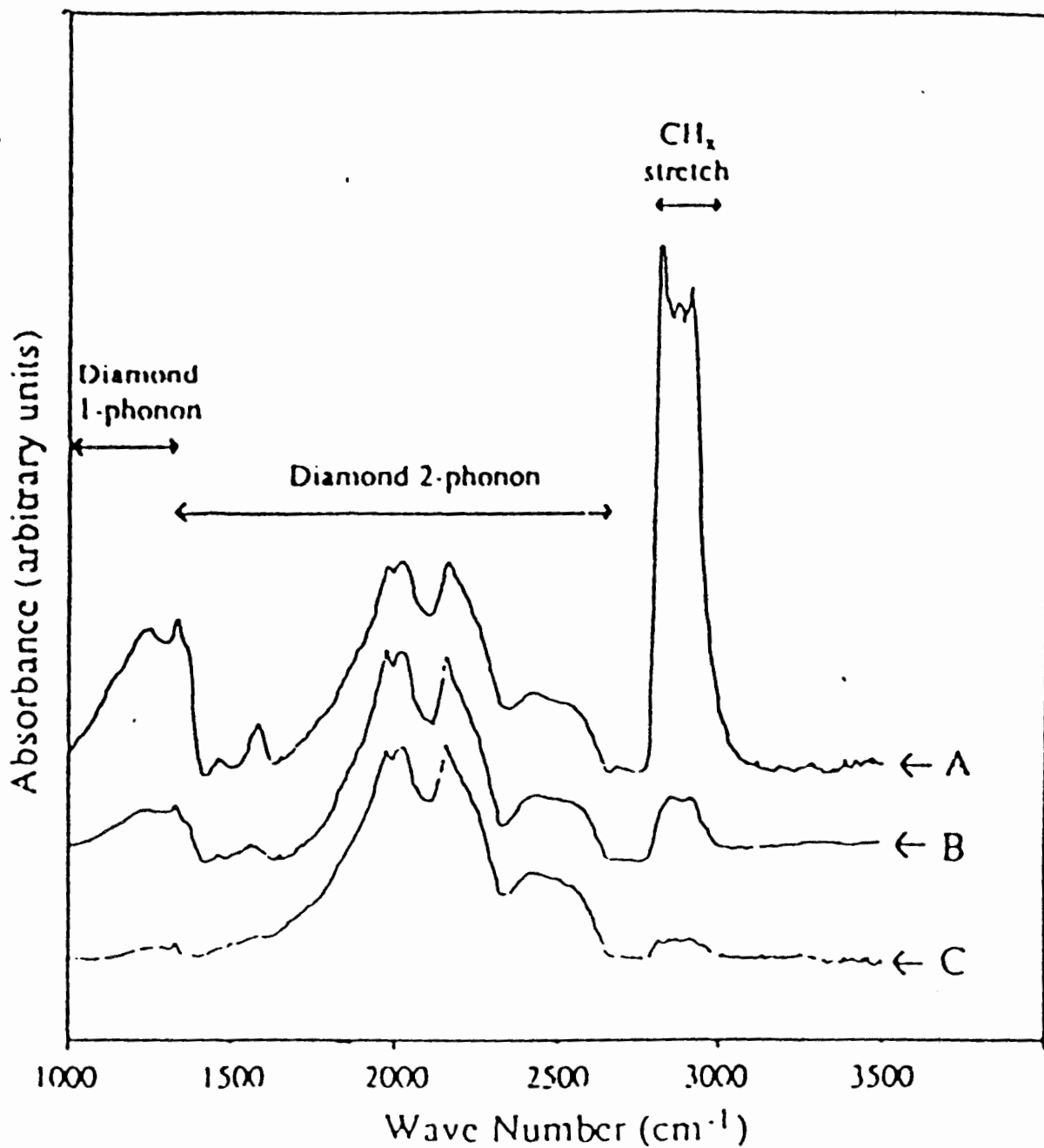


TABLE I. Comparison of Characterization Methods.

section	technique	depth probed (nm)	width probed (nm)	imaging	depth profiling	in situ	sp ² carbon	hydrogen	metals	other impurities	electronic states	vacancies	texture	disorder	usage
2.1	Raman	sample dependent	10 ³		3	2	1							1	1
2.2	IR	bulk	10 ⁴		3	3	2	1		N,O					1
3.1	ESR	bulk	bulk	3					1	many		1		2	3
3.2	NMR	bulk	bulk				1	1		F				1	3
4.1	RBS	10 ³	10 ⁶		1				1	heavy				1	3
4.2	ERS	10 ³	10 ⁶		1			1							2
4.3	SIMS	2	10 ³		1				1	many					3
5.3	AES	2	100	3	1		1			many				1	1
5.1	XPS	3	10 ⁵		2		1			many				1	1
5.2	UPS	1	10 ⁶		2	3	2				3				3
6.1	SEM	10 ³	10	1									1	2	1
6.1	EMPA	10 ³	10 ³	2					1	many					3
6.2	TEM	200	5	1									2	1	2
6.4	STM	1	10	1							1				3
6.5	AFM	1	1	1											3
7.1	XRD	10 ⁴	10 ⁶										1	1	1
7.2	ED	10	10	3									1	1	3
7.3	RHEED	1	10 ⁵											1	3
8.1	Ellipsometry	10	10			1	1							1	3
8.2	Mossbauer	bulk	bulk						1			1		1	3
8.3	Positron Annihilation	bulk	bulk									1		1	3

1 = often 2 = occasionally 3 = seldom



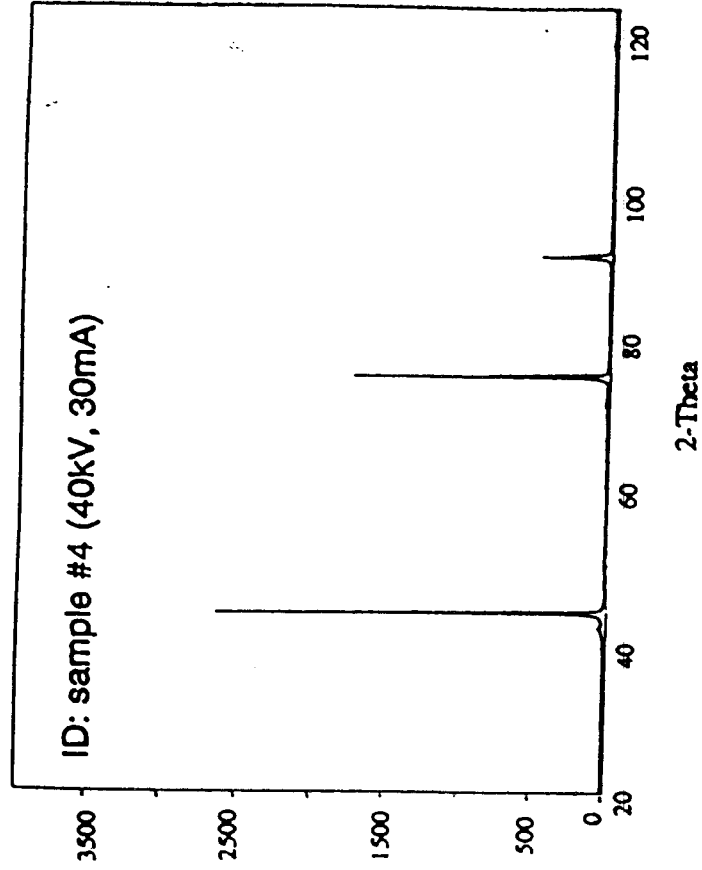
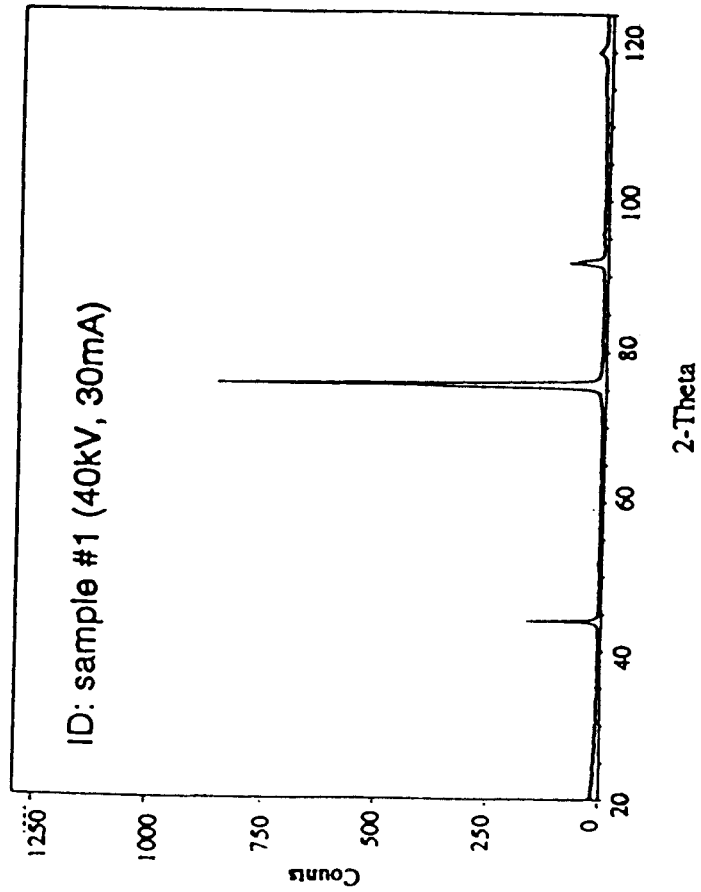


Fig.4 XRD patterns of strong (110)-oriented sample 1, and nearly random-textured sample 4.

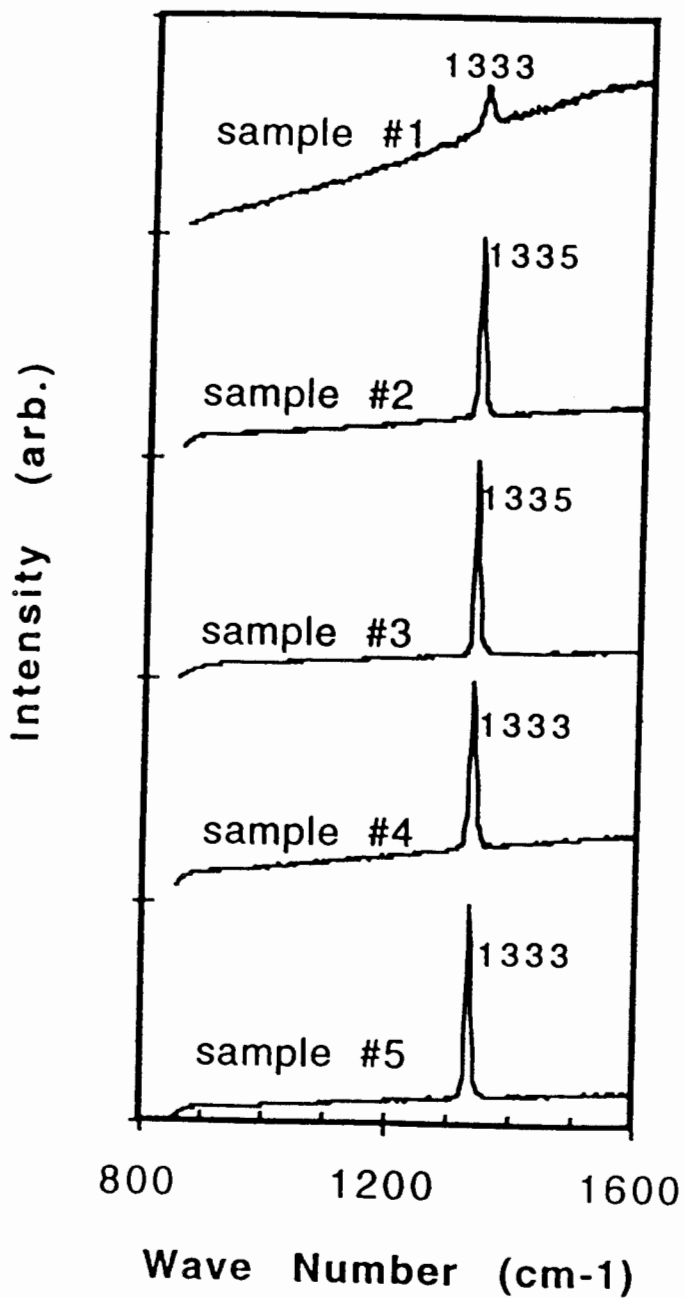


Fig.2 Raman spectra excited at 514.5 nm

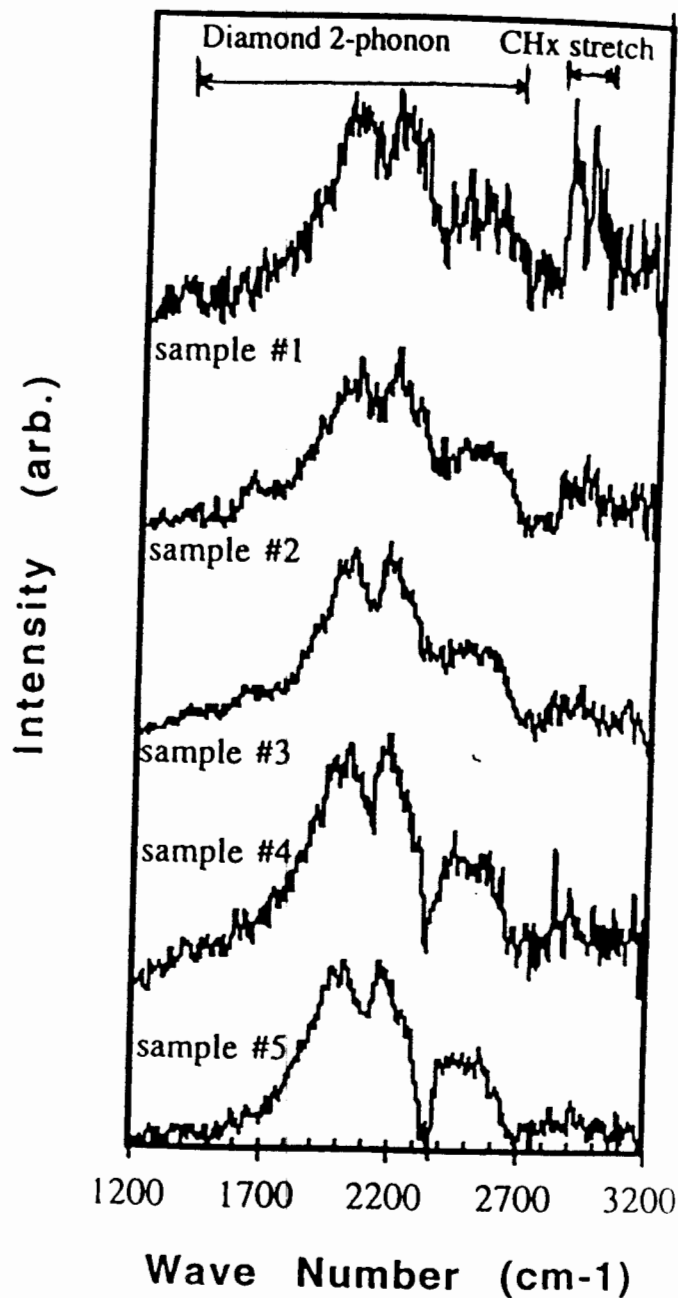
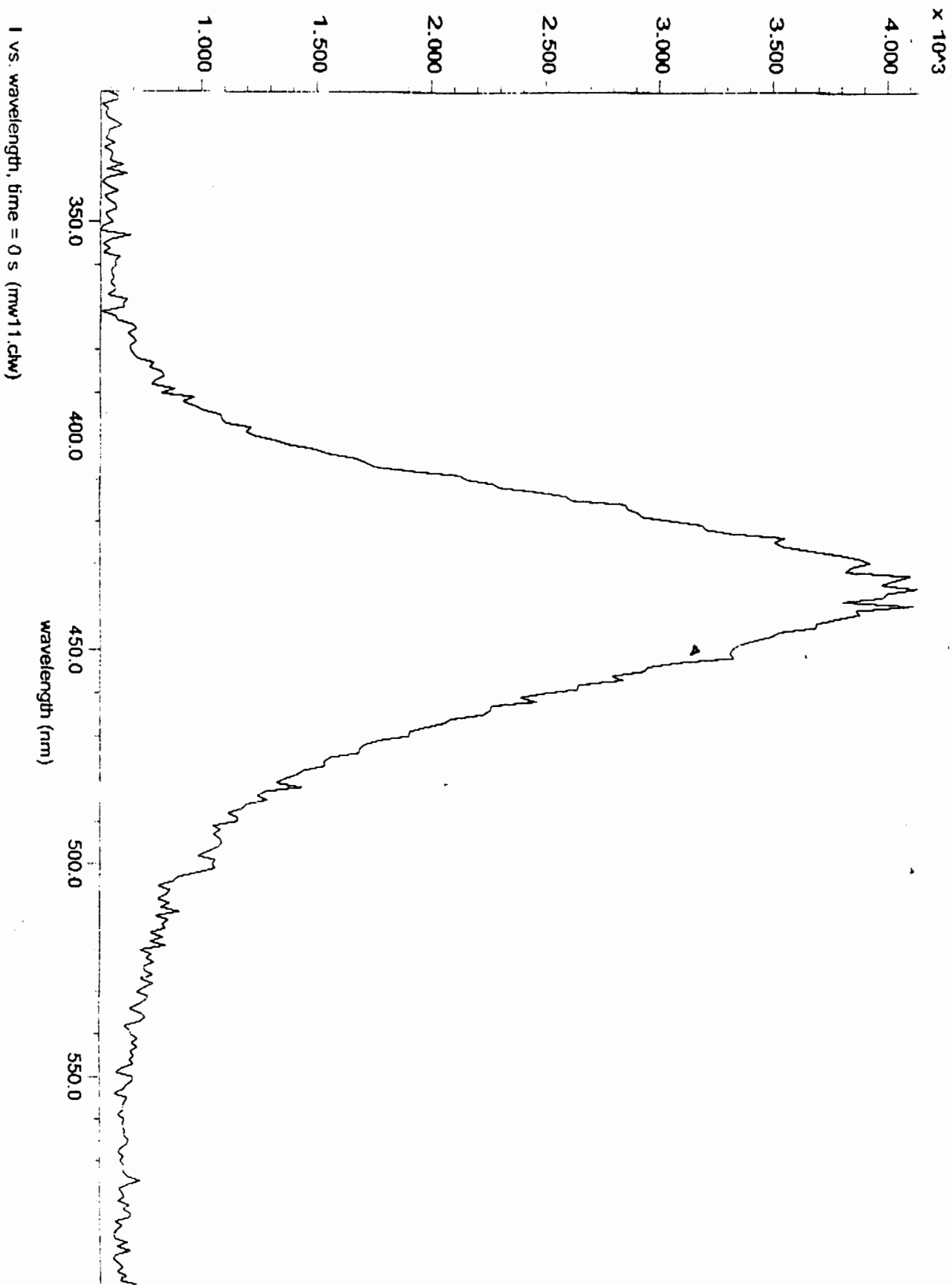


Fig.3 FTIR spectra arranged in decreasing amount of hydrogen in samples



Detector = 1 Mode = Photon counting
Gain = 47.0 % Offset = 6.0 % HT = 81.4 %
Averaging Time = 1000 ms Inverted = no

