APPENDIX A

Our work on the lower-valent manganese oxides is summarized in this appendix. Table 1A contains information on sample locality and purity. Figures 1A-8A are representative of the various manganese oxides listed in Table 1A. They were all obtained on TlBr pellets under the same conditions as the figures presented in the text. Where the corresponding spectrum in KBr differs significantly it is included in Appendix B. Spectra of samples in Table 1A not included in this appendix are contained in Appendix B as indicated in Table 1A.

Table 1A. Sample information[1]

	sample #	locality	ident. #	ref. #	fig. #	purity x-ray	purity IR
Braunite Mn_7SiO_{12}	70	Palos Verdes, Hills, Calif.	CIT 9461	2	1A	pure	pure
Groutite MnO(OH)	71	Cuyuna Range, Minnesota	NMNH 105004	3	2A,16B	pure	pure
	72	Talcville, New York	NMNH 113969	4	16B		pure
	73	Anadia, Portugal	NMNH 133850		16B		t,qtz
Hausmannite Mn_3O_4	74	Langban, Sweden	CIT 9462		17B		pure
	75	Synthetic	CIT 9463	5	3A,17B	pure	pure
	76	Synthetic	CIT 9618	6	17B		pure
Manganite MnO(OH)	77	Sagamore Mine, Minnesota	CIT 6048		18B	t,imp	pure
	78	Synthetic	CIT 9619	7	4A	pure	pure
Manganosite MnO	79	Langban, Sweden	CIT 2400		19B	t,pyc	t,pyc
	80	Synthetic	CIT 9620	8	5A,19B		pure
Marokite $CaMn_2O_4$	81	Tachgagalt, Morocco	LCM 13888		6A	pure	pure
Partridgeite Mn_2O_3	82	Postmasburg, S. Africa	HAV 110400		20B		pure
	83	Synthetic	CIT 9621	9	7A	t,pyr	t,pyr?
Quenselite $PbMnO_2(OH)$	84	Langban, Sweden	CIT 3097		8A	pure	pure

1. The abbreviations and the criteria for X-ray purity are the same as for Table 1.
2. Mitchell and Corey, 1973.
3. Gruner, 1947
4. Segeler, 1959.
5. Synthetic method: Giovanoli et al., 1967.
6. Manganous manganic oxide from Diamond Shamrock Chemical Company; Baltimore, Maryland.
7. Synthetic method: The synthetic method of Wadsley (1950b) for psilomelane produced a pure manganite. It was subsequently found that the manganous manganate used was contaminated with hausmannite.
8. Manganous oxide from Diamond Shamrock Chemical Company; Baltimore, Maryland; 0.01% Fe, 0.5% MnO_2 by their analysis.
9. Manganese sesquioxide HPX from Diamond Shamrock Chemical Company; Baltimore, Maryland.

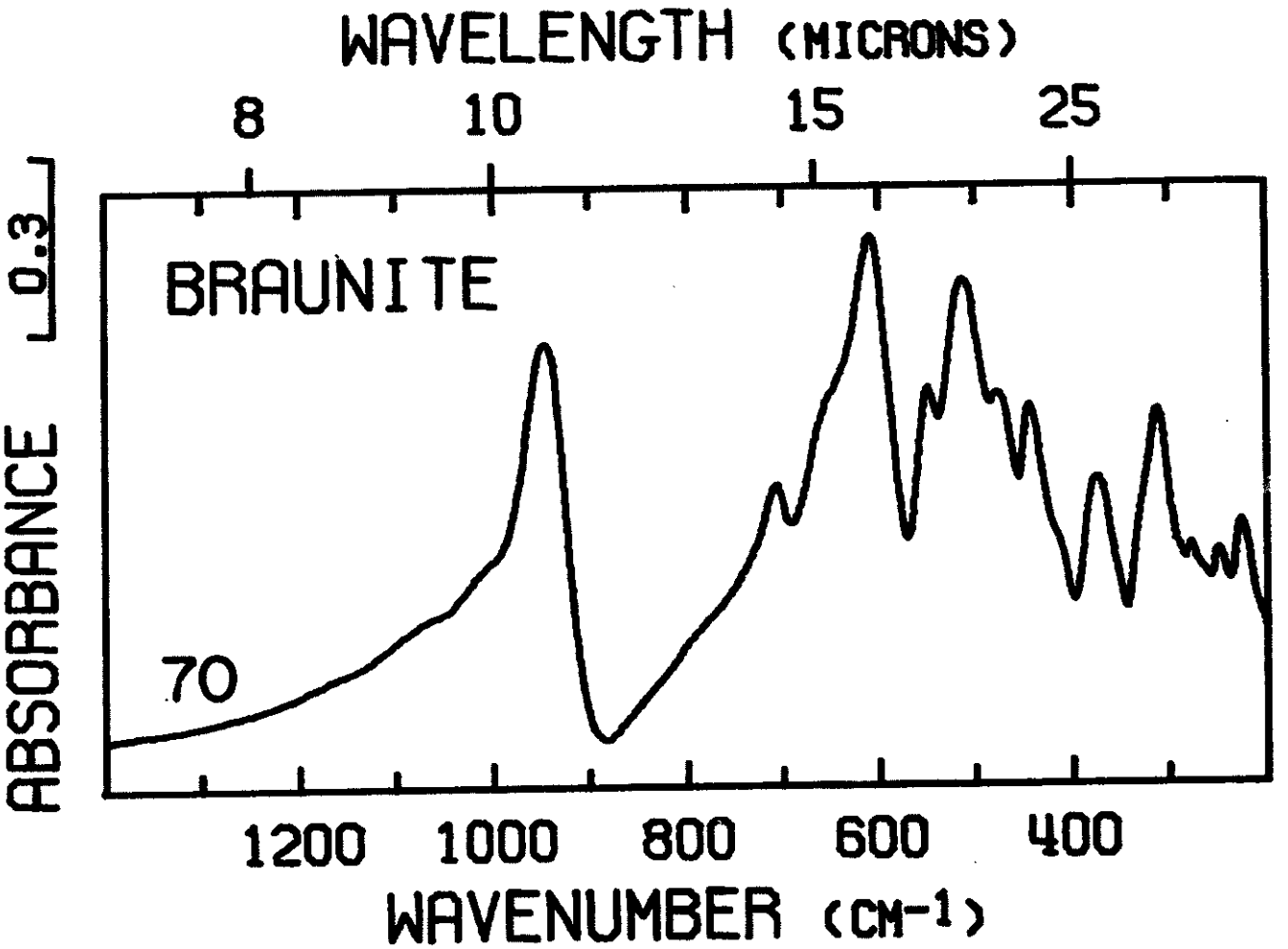

Figure 1A. Infrared spectrum of braunite. Presentation intensity: 344%.

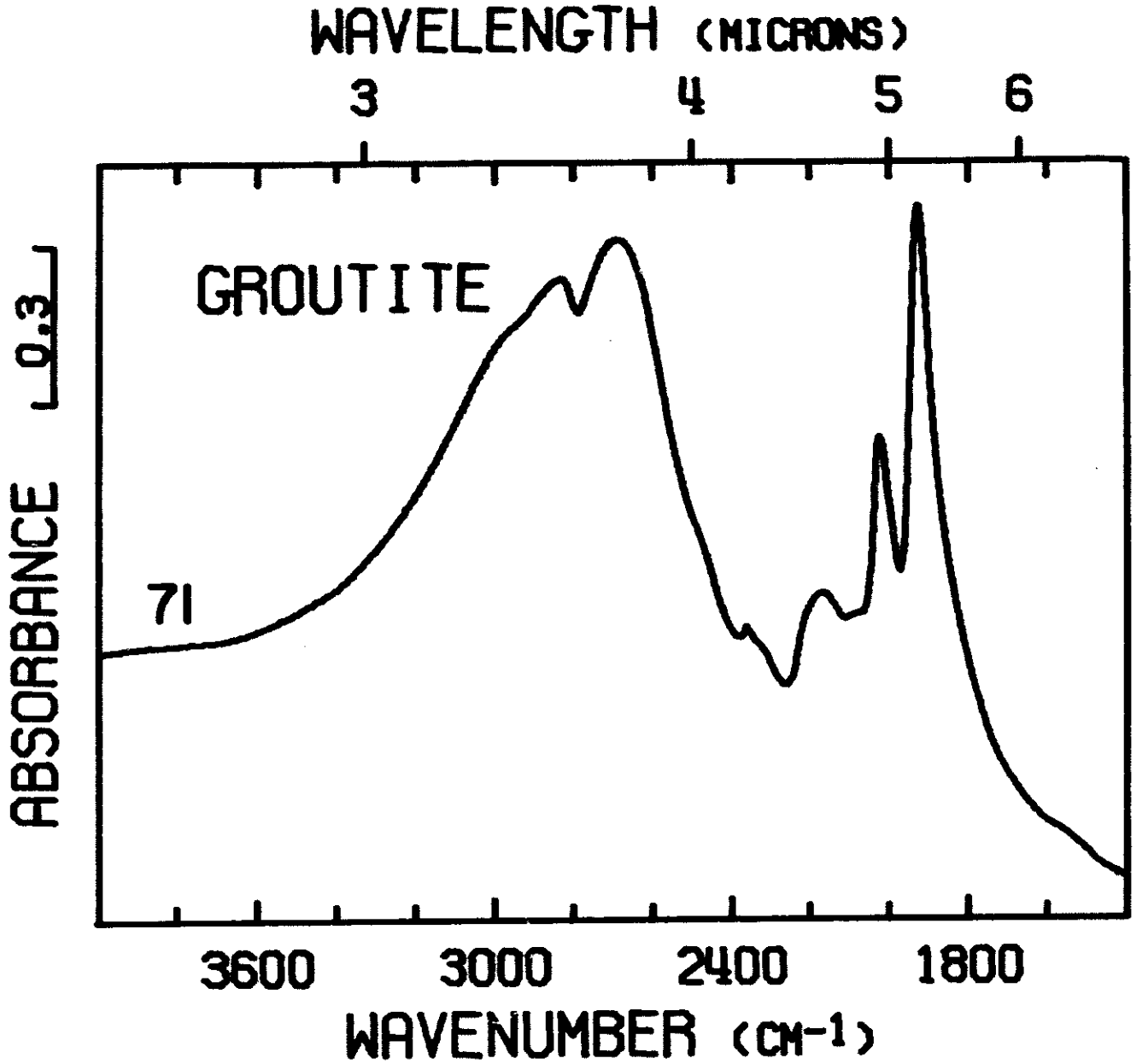

Figure 2A. Infrared spectrum of groutite. Presentation intensity: 268%. Figure continued on following page.

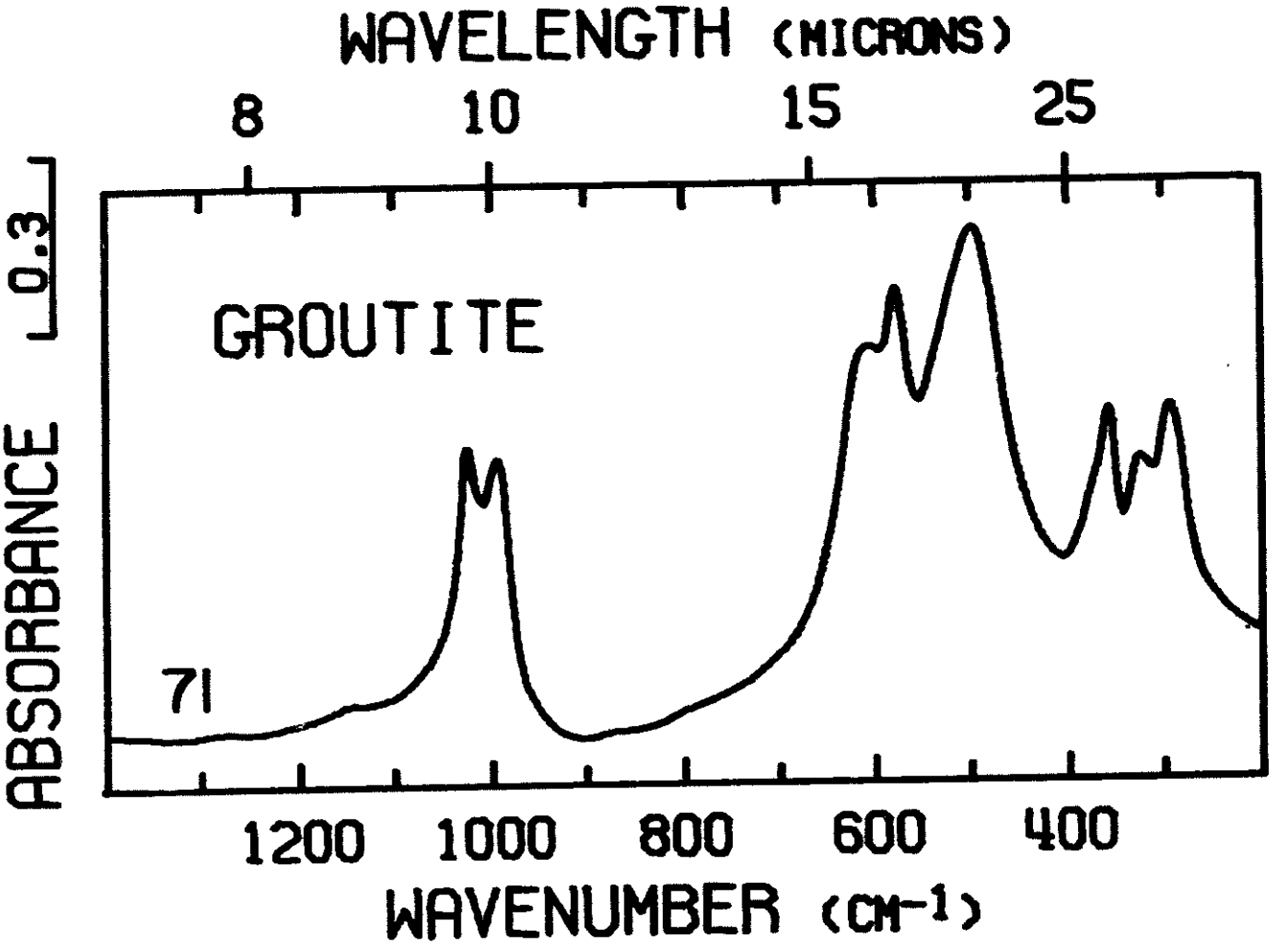

Figure 2A. Continued from preceding page.

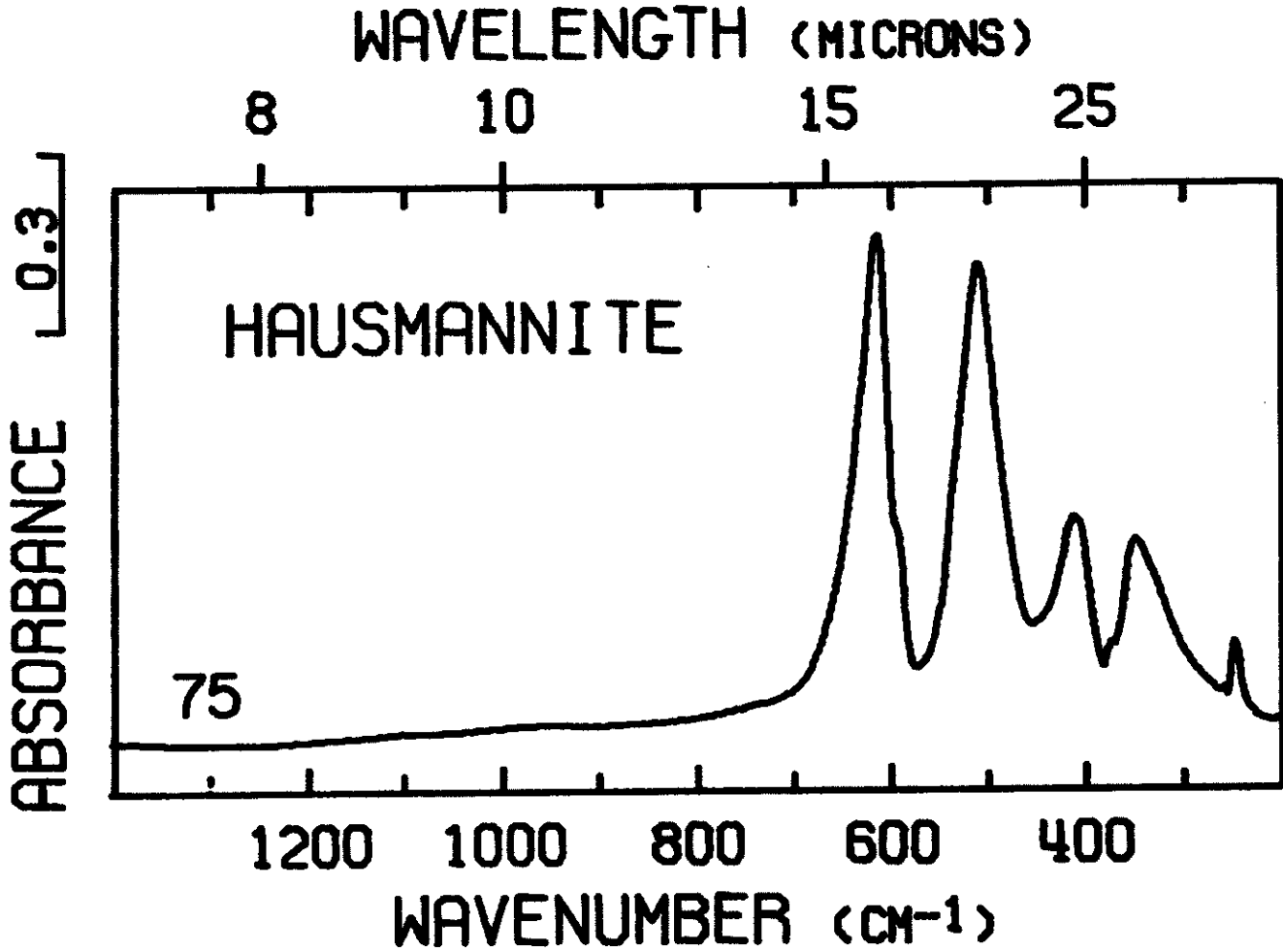

Figure 3A. Infrared spectrum of hausmannite. Presentation intensity: 182%.

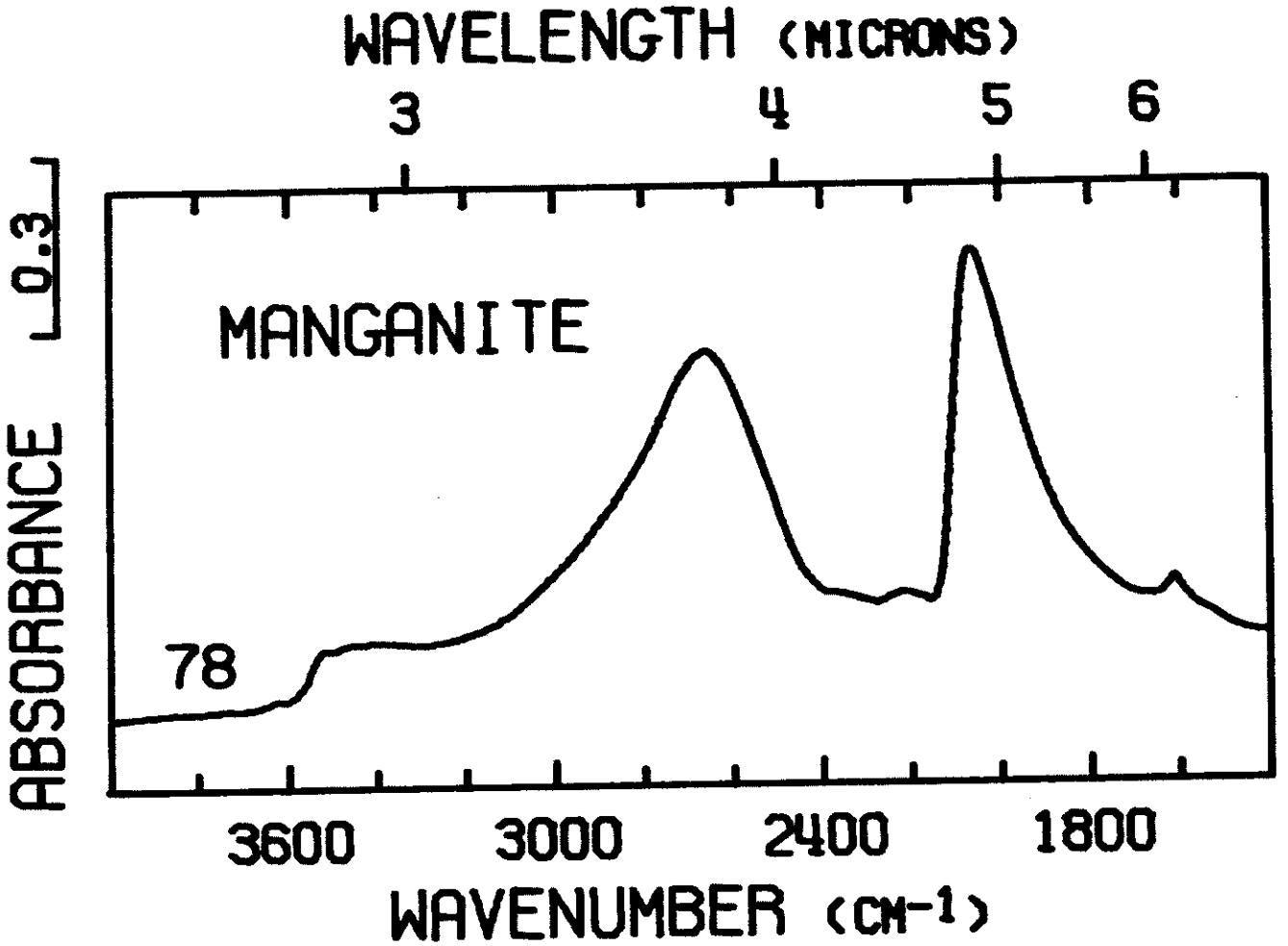

Figure 4A. Infrared spectrum of manganite. Presentation intensity: 81%. Figure continued on following page.

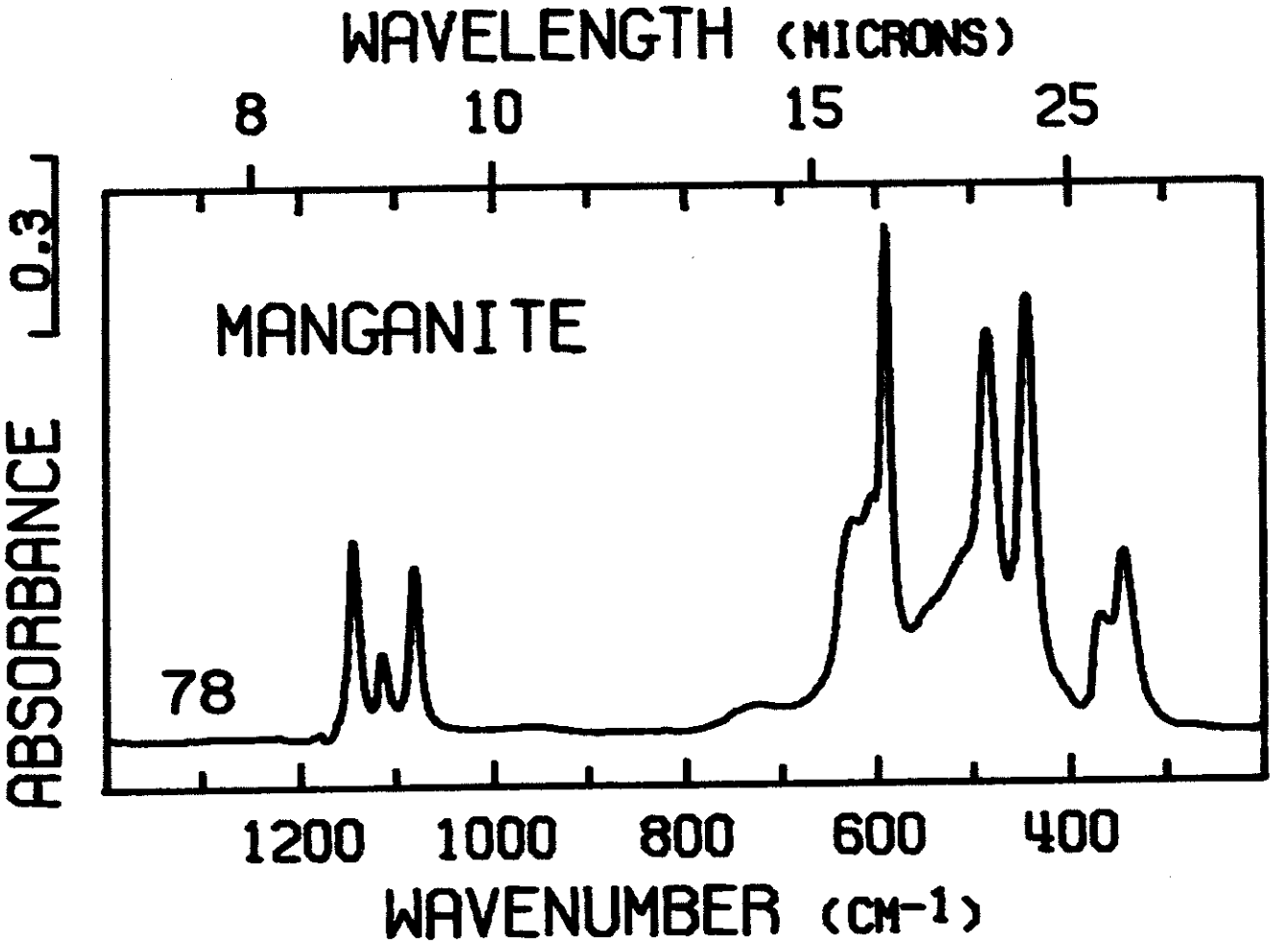

Figure 4A. Continued from preceding page.

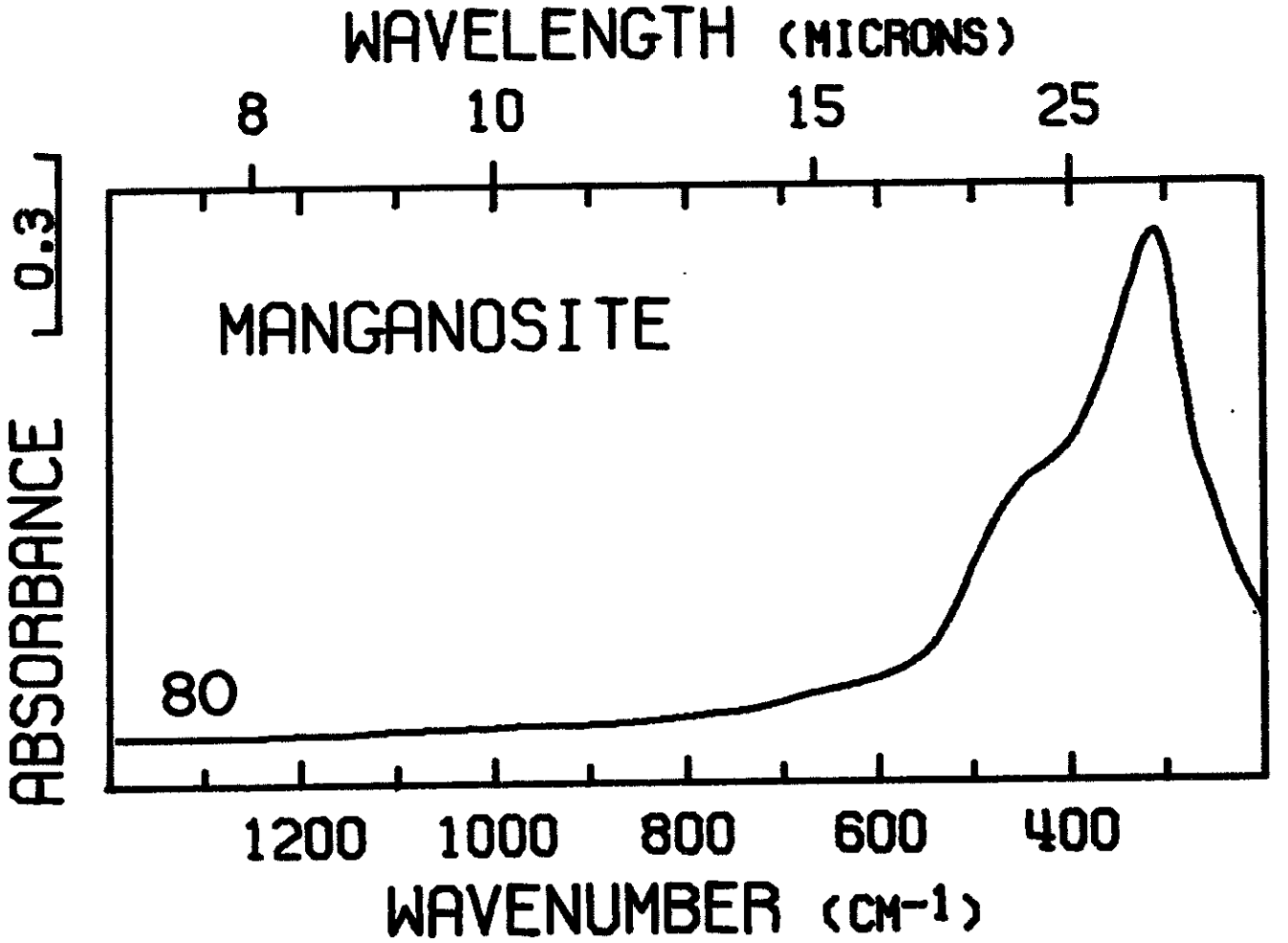

Figure 5A. Infrared spectrum of manganosite. Presentation intensity: 244%.

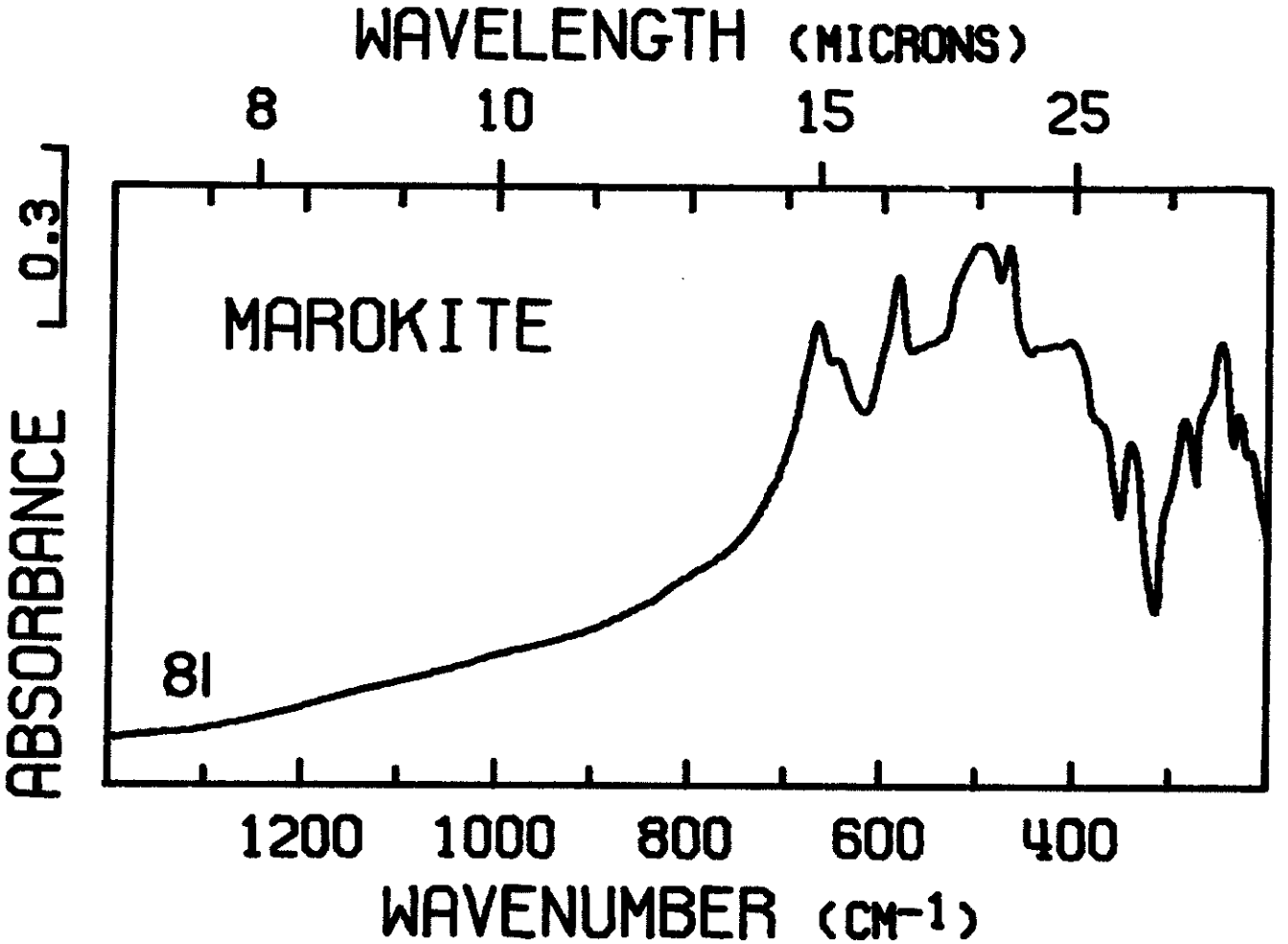

Figure 6A. Infrared spectrum of marokite. Presentation intensity: 414%.

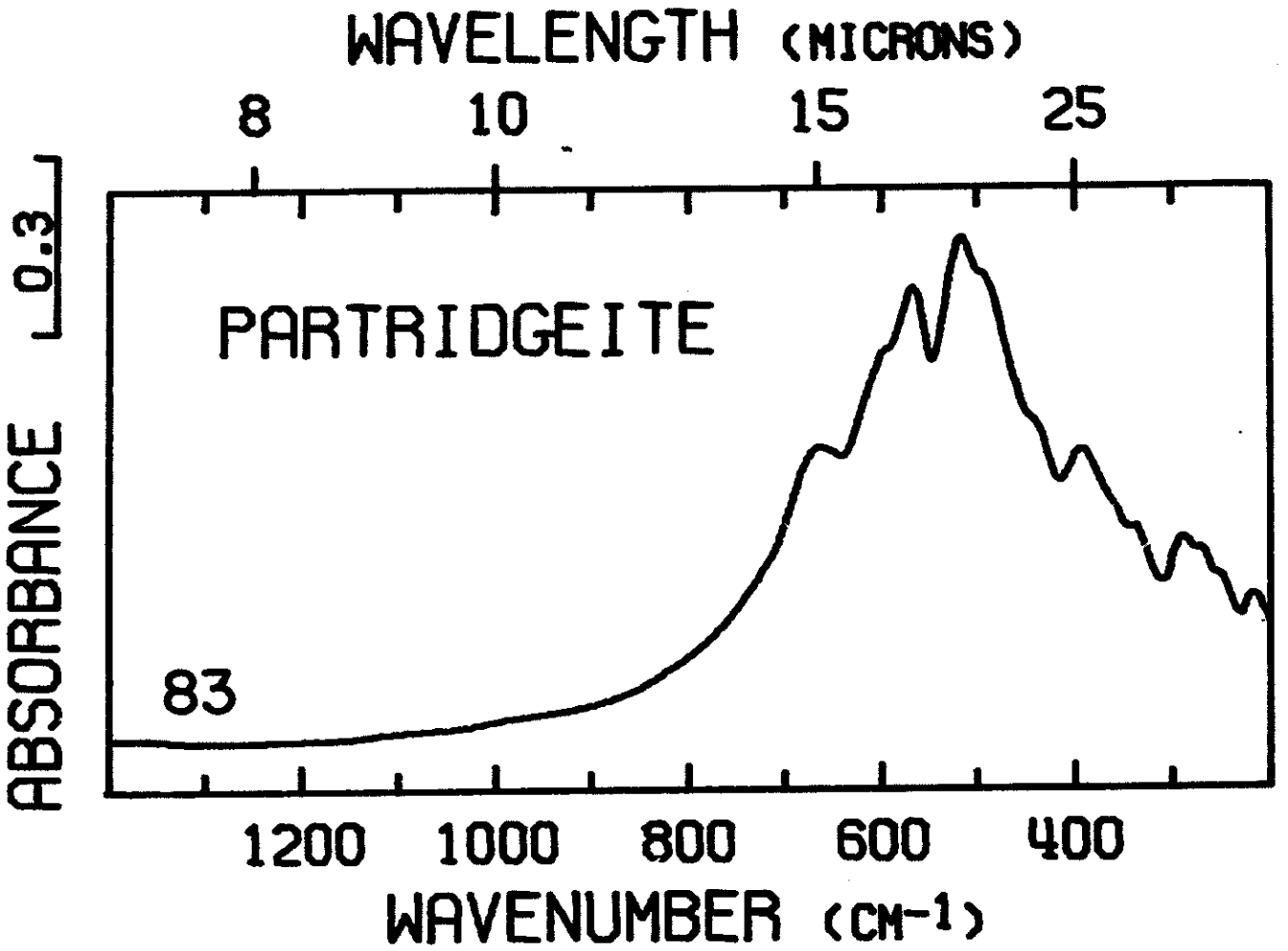

Figure 7A. Infrared spectrum of partridgeite. Presentation intensity: 248%.

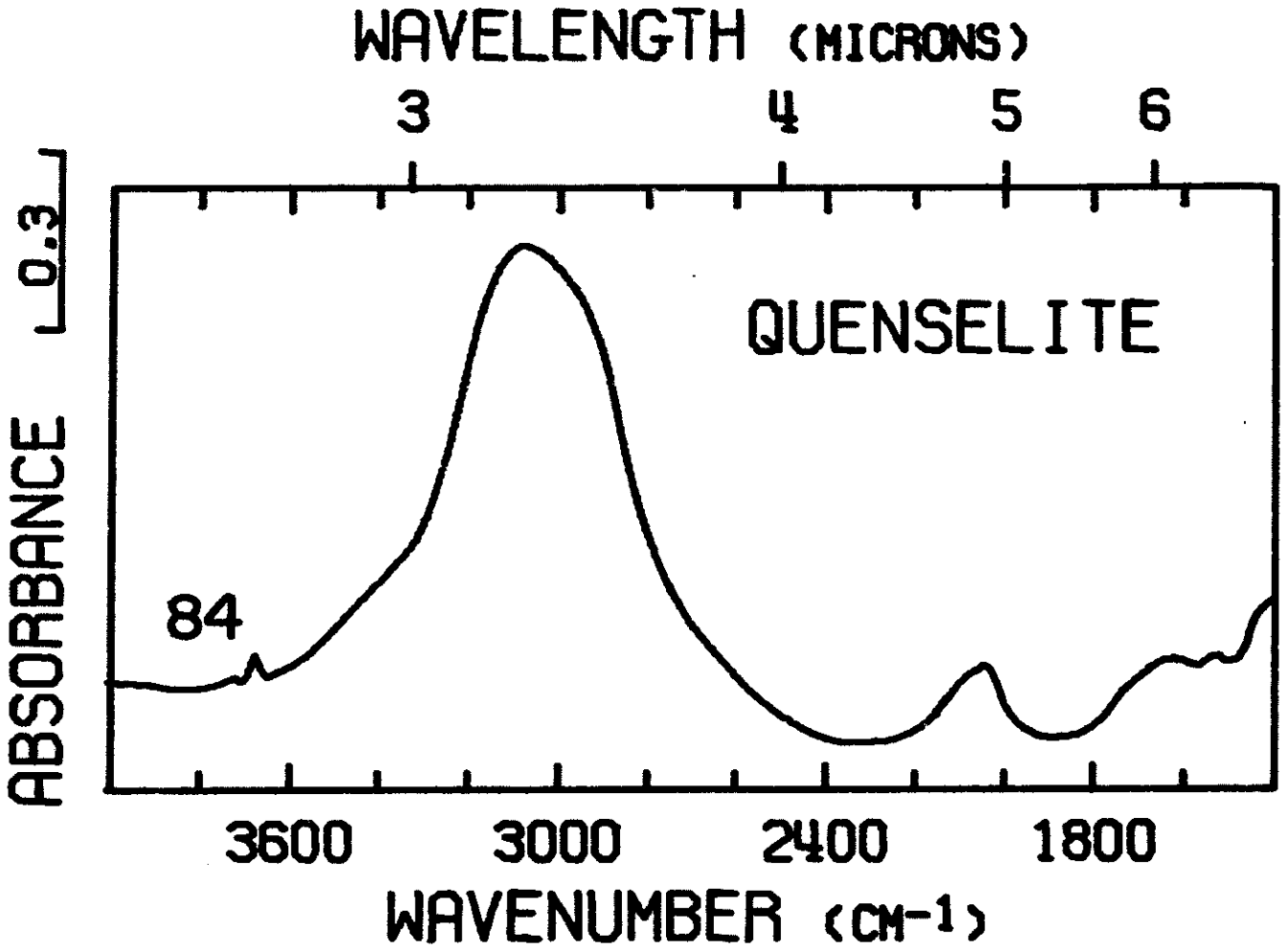

Figure 8A. Infrared spectrum of quenselite. Presentation intensity: 404%. Figure continued on following page.

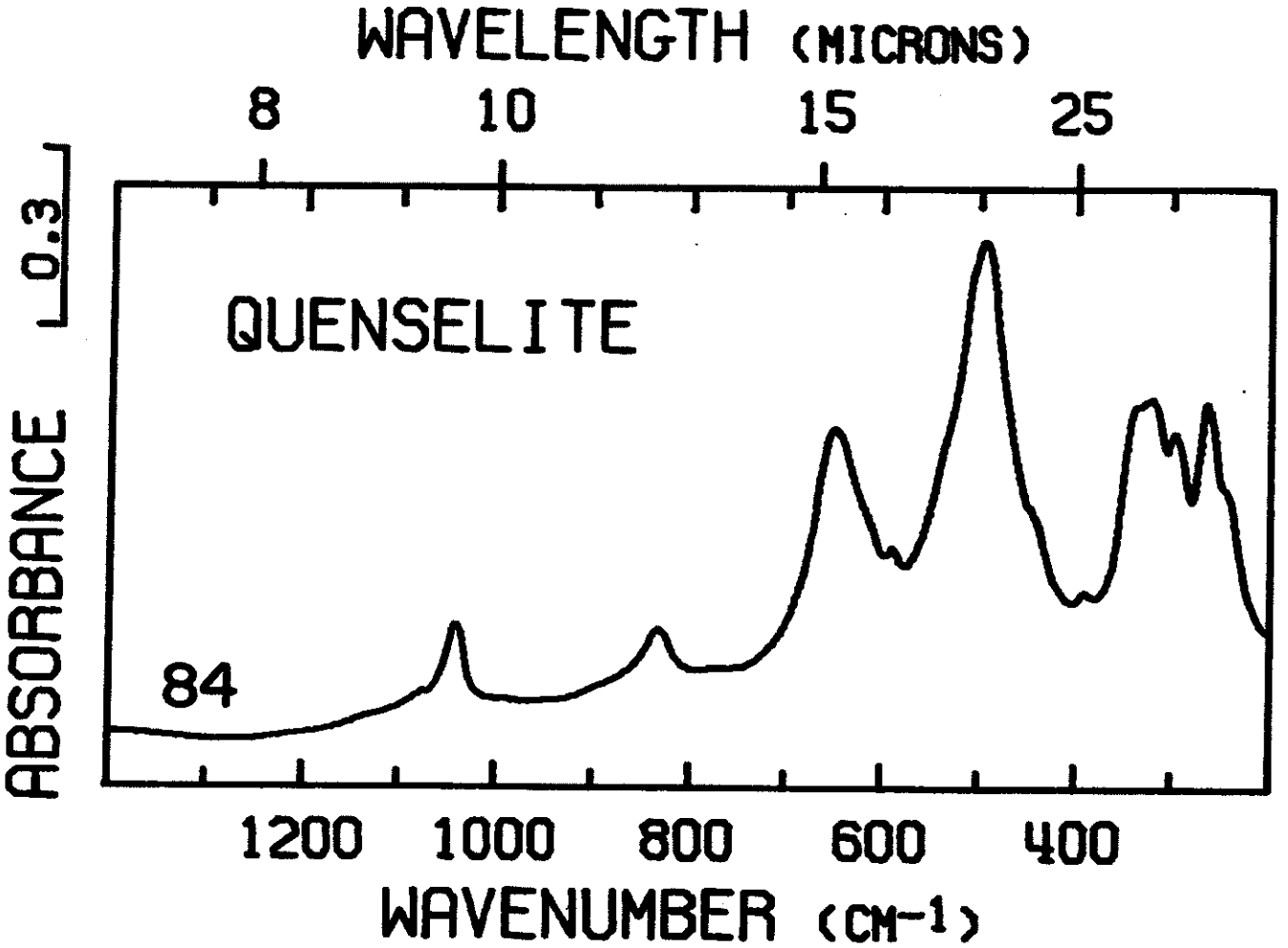

Figure 8A. Continued from preceding page.