

Table 1. Experimental transition frequencies (MHz) of vinylcyanoacetylene (**I**) and cyanovinylacetylene (**II**) and residuals $o - c$ (kHz).

$J' - J''$	$F' - F''$	I		II	
		Frequency	$o - c$	Frequency	$o - c$
$3_{1,3} - 2_{1,2}$	3 - 2	8048.6958 (20)	1.4	8626.1631 (20)	0.8
$3_{1,3} - 2_{1,2}$	2 - 1	8049.0508 (20)	0.4	8626.4961 (20)	-0.4
$3_{1,3} - 2_{1,2}$	4 - 3	8049.0645 (20)	1.0	8626.5127 (20)	0.8
$3_{0,3} - 2_{0,2}$	2 - 1	8118.7520 (20)	-0.7	8694.8604 (20)	0.2
$3_{0,3} - 2_{0,2}$	3 - 2	8118.9573 (20)	-1.5	8695.0562 (20)	1.2
$3_{0,3} - 2_{0,2}$	4 - 3	8119.0074 (20)	-0.5	8695.1026 (20)	1.1
$3_{1,2} - 2_{1,1}$	3 - 2	8189.3521 (20)	1.3	8763.8760 (20)	-0.8
$3_{1,2} - 2_{1,1}$	2 - 1	8189.7183 (20)	1.2	8764.2217 (20)	-1.8
$3_{1,2} - 2_{1,1}$	4 - 3	8189.7183 (20)	1.2	8764.2217 (20)	-1.8
$4_{1,4} - 3_{1,3}$	4 - 3	10731.7739 (20)	0.9	11501.7276 (20)	1.5
$4_{1,4} - 3_{1,3}$	3 - 2	10731.8804 (20)	-1.0	11501.8291 (20)	1.5
$4_{1,4} - 3_{1,3}$	5 - 4	10731.9375 (20)	-0.1	11501.8819 (20)	-0.3
$4_{0,4} - 3_{0,3}$	3 - 2	10824.9776 (20)	-1.1	11593.1475 (20)	-0.4
$4_{0,4} - 3_{0,3}$	4 - 3	10825.0669 (20)	-0.1	11593.2315 (20)	0.2
$4_{0,4} - 3_{0,3}$	5 - 4	10825.0982 (20)	-0.1	11593.2613 (20)	0.4
$4_{1,3} - 3_{1,2}$	4 - 3	10919.3115 (20)	0.2	11685.3438 (20)	0.2
$4_{1,3} - 3_{1,2}$	3 - 2	10919.4239 (20)	0.4	11685.4522 (20)	1.4
$4_{1,3} - 3_{1,2}$	5 - 4	10919.4751 (20)	0.5	11685.4986 (20)	0.9

Table 1—Continued

		I		II	
$J' - J''$	$F' - F''$	Frequency	$o - c$	Frequency	$o - c$
$5_{1,5} - 4_{1,4}$	5 – 4	13414.6973 (20)	0.2	14377.1480 (20)	–0.9
$5_{1,5} - 4_{1,4}$	4 – 3	13414.7412 (20)	1.0	14377.1900 (20)	0.9
$5_{1,5} - 4_{1,4}$	6 – 5	13414.7876 (20)	0.3	14377.2359 (20)	1.4
$5_{0,5} - 4_{0,4}$	4 – 3	13530.9434 (20)	–1.7	14491.2120 (20)	1.1
$5_{0,5} - 4_{0,4}$	5 – 4	13530.9927 (20)	–1.4	14491.2579 (20)	0.7
$5_{0,5} - 4_{0,4}$	6 – 5	13531.0157 (20)	–0.1	14491.2774 (20)	–0.4
$5_{1,4} - 4_{1,3}$	5 – 4	13649.1148 (20)	0.6	14606.6680 (20)	0.1
$5_{1,4} - 4_{1,3}$	4 – 3	13649.1587 (20)	–0.7	14606.7120 (20)	0.8
$5_{1,4} - 4_{1,3}$	6 – 5	13649.2036 (20)	0.2	14606.7539 (20)	1.8
$6_{1,6} - 5_{1,5}$	6 – 5	16097.5284 (20)	0.6	17252.4883 (20)	–1.1
$6_{1,6} - 5_{1,5}$	5 – 4	16097.5489 (20)	1.7	17252.5078 (20)	0.4
$6_{1,6} - 5_{1,5}$	7 – 6	16097.5840 (20)	0.4	17252.5420 (20)	–0.4
$6_{0,6} - 5_{0,5}$	5 – 4	16236.6599 (20)	–3.8	17389.0655 (20)	–0.4
$6_{0,6} - 5_{0,5}$	6 – 5	16236.6954 (20)	0.6	17389.0938 (20)	–1.4
$6_{0,6} - 5_{0,5}$	7 – 6	16236.7100 (20)	–0.8	17389.1114 (20)	1.0
$6_{1,5} - 5_{1,4}$	6 – 5	16378.8208 (20)	1.4	17527.9073 (20)	–0.5
$6_{1,5} - 5_{1,4}$	5 – 4	16378.8414 (20)	1.3	17527.9278 (20)	–0.0
$6_{1,5} - 5_{1,4}$	7 – 6	16378.8750 (20)	0.4	17527.9600 (20)	0.2

Table 1—Continued

$J' - J''$	$F' - F''$	I		II	
		Frequency	$o - c$	Frequency	$o - c$
$7_{1,7} - 6_{1,6}$	7 – 6	18780.2715 (20)	0.9	20127.7520 (20)	–2.3
$7_{1,7} - 6_{1,6}$	6 – 5	18780.2783 (20)	–1.5	20127.7637 (20)	1.0
$7_{1,7} - 6_{1,6}$	8 – 7	18780.3076 (20)	–0.5	20127.7871 (20)	–2.8
$7_{0,7} - 6_{0,6}$	6 – 5	18942.1006 (20)	–1.8	20286.6905 (20)	3.0
$7_{0,7} - 6_{0,6}$	7 – 6	18942.1241 (20)	0.2	20286.7071 (20)	–0.7
$7_{0,7} - 6_{0,6}$	8 – 7	18942.1358 (20)	–0.4	20286.7227 (20)	3.3
$7_{1,6} - 6_{1,5}$	7 – 6	19108.4336 (20)	2.1	20449.0664 (20)	–2.9
$7_{1,6} - 6_{1,5}$	6 – 5	19108.4405 (20)	–1.2	20449.0801 (20)	1.0
$7_{1,6} - 6_{1,5}$	8 – 7	19108.4688 (20)	0.3	20449.1026 (20)	–1.6
$8_{1,8} - 7_{1,7}$	8 – 7	21462.9190 (20)	–0.2	23002.9385 (20)	–1.8
$8_{1,8} - 7_{1,7}$	7 – 6	21462.9248 (20)	1.3	23002.9385 (20)	–1.8
$8_{1,8} - 7_{1,7}$	9 – 8	21462.9473 (20)	1.4	23002.9629 (20)	–1.0
$8_{0,8} - 7_{0,7}$	7 – 6	21647.2188 (20)	–1.8	23184.0410 (20)	–1.6
$8_{0,8} - 7_{0,7}$	8 – 7	21647.2354 (20)	–0.9	23184.0566 (20)	–0.8
$8_{0,8} - 7_{0,7}$	9 – 8	21647.2461 (20)	0.1	23184.0684 (20)	1.7
$8_{1,7} - 7_{1,6}$	8 – 7	21837.9424 (20)	–0.5	23370.1465 (30)	–2.6
$8_{1,7} - 7_{1,6}$	7 – 6	21837.9492 (20)	1.3	23370.1465 (30)	–2.6
$8_{1,7} - 7_{1,6}$	9 – 8	21837.9697 (20)	0.5	23370.1700 (20)	–1.5

Table 1—Continued

$J' - J''$	$F' - F''$	I		II	
		Frequency	$o - c$	Frequency	$o - c$
$9_{1,9} - 8_{1,8}$	9 – 8	24145.4639 (20)	–0.4	—	—
$9_{1,9} - 8_{1,8}$	8 – 7	24145.4639 (20)	–0.4	—	—
$9_{1,9} - 8_{1,8}$	10 – 9	24145.4834 (20)	0.0	—	—
$9_{0,9} - 8_{0,8}$	8 – 7	24351.9727 (20)	–2.1	—	—
$9_{0,9} - 8_{0,8}$	9 – 8	24351.9844 (20)	–2.4	—	—
$9_{0,9} - 8_{0,8}$	10 – 9	24351.9961 (20)	1.4	—	—
$9_{1,8} - 8_{1,7}$	9 – 8	24567.3438 (20)	0.6	—	—
$9_{1,8} - 8_{1,7}$	8 – 7	24567.3438 (20)	0.6	—	—
$9_{1,8} - 8_{1,7}$	10 – 9	24567.3623 (20)	0.7	—	—
$10_{1,10} - 9_{1,9}$	10 – 9	26827.8926 (40)	0.2	—	—
$10_{1,10} - 9_{1,9}$	9 – 8	26827.8926 (40)	0.2	—	—
$10_{1,10} - 9_{1,9}$	11 – 10	26827.9112 (40)	3.7	—	—
$10_{0,10} - 9_{0,9}$	9 – 8	27056.3154 (40)	–5.7	28977.8037 (40)	–5.3
$10_{0,10} - 9_{0,9}$	10 – 9	27056.3291 (40)	–1.4	28977.8174 (40)	–0.4
$10_{0,10} - 9_{0,9}$	11 – 10	27056.3389 (40)	1.8	28977.8262 (40)	2.1
$10_{1,9} - 9_{1,8}$	10 – 9	—	—	—	—
$10_{1,9} - 9_{1,8}$	9 – 8	—	—	—	—
$10_{1,9} - 9_{1,8}$	11 – 10	—	—	—	—

Table 1—Continued

$J' - J''$	$F' - F''$	I		II	
		Frequency	$o - c$	Frequency	$o - c$
$11_{1,11} - 10_{1,10}$	10 – 9	29510.1934 (40)	–0.0	—	
$11_{1,11} - 10_{1,10}$	11 – 10	29510.1934 (40)	–0.0	—	
$11_{1,11} - 10_{1,10}$	12 – 11	29510.2100 (40)	4.3	—	
$11_{0,11} - 10_{0,10}$	10 – 9	29760.2110 (40)	–4.1	—	
$11_{0,11} - 10_{0,10}$	11 – 10	29760.2305 (40)	5.0	—	
$11_{0,11} - 10_{0,10}$	12 – 11	29760.2305 (40)	5.0	—	
$11_{1,10} - 10_{1,9}$	11 – 10	30025.7490 (40)	–2.5	—	
$11_{1,10} - 10_{1,9}$	10 – 9	30025.7490 (40)	–2.5	—	
$11_{1,10} - 10_{1,9}$	12 – 11	30025.7647 (40)	1.3	—	
$12_{1,12} - 11_{1,11}$	11 – 10	32192.3545 (40)	–1.0	—	
$12_{1,12} - 11_{1,11}$	12 – 11	32192.3545 (40)	–1.0	—	
$12_{1,12} - 11_{1,11}$	13 – 12	32192.3702 (40)	4.6	—	
$12_{0,12} - 11_{0,11}$	11 – 10	32463.6094 (40)	–2.8	34770.0684 (40)	–3.2
$12_{0,12} - 11_{0,11}$	12 – 11	32463.6250 (40)	4.2	34770.0840 (40)	4.3
$12_{0,12} - 11_{0,11}$	13 – 12	32463.6250 (40)	4.2	34770.0840 (40)	4.3
$12_{1,11} - 11_{1,10}$	11 – 10	32754.7324 (40)	–1.6	—	
$12_{1,11} - 11_{1,10}$	12 – 11	32754.7324 (40)	–1.6	—	
$12_{1,11} - 11_{1,10}$	13 – 12	32754.7471 (40)	3.2	—	

Table 1—Continued

$J' - J''$	$F' - F''$	I		II	
		Frequency	$o - c$	Frequency	$o - c$
$13_{1,13} - 12_{1,12}$	12 – 11	34874.3633 (40)	–3.3	—	
$13_{1,13} - 12_{1,12}$	13 – 12	34874.3633 (40)	–3.3	—	
$13_{1,13} - 12_{1,12}$	14 – 13	34874.3750 (40)	–0.2	—	
$13_{0,13} - 12_{0,12}$	12 – 11	35166.4688 (40)	0.7	37665.5488 (40)	–2.3
$13_{0,13} - 12_{0,12}$	13 – 12	35166.4805 (40)	5.1	37665.5488 (40)	–2.3
$13_{0,13} - 12_{0,12}$	14 – 13	35166.4805 (40)	5.1	37665.5488 (40)	–2.3
$13_{1,12} - 12_{1,11}$	12 – 11	35483.5449 (40)	–5.0	—	
$13_{1,12} - 12_{1,11}$	13 – 12	35483.5449 (40)	–5.0	—	
$13_{1,12} - 12_{1,11}$	14 – 13	35483.5586 (40)	0.4	—	
$14_{1,14} - 13_{1,13}$	13 – 12	37556.2149 (40)	–2.8	—	
$14_{1,14} - 13_{1,13}$	14 – 13	37556.2149 (40)	–2.8	—	
$14_{1,14} - 13_{1,13}$	15 – 14	37556.2149 (40)	–2.8	—	
$14_{0,14} - 13_{0,13}$	13 – 12	37868.7442 (40)	1.2	—	
$14_{0,14} - 13_{0,13}$	14 – 13	37868.7442 (40)	1.2	—	
$14_{0,14} - 13_{0,13}$	15 – 14	37868.7442 (40)	1.2	—	
$14_{1,13} - 13_{1,12}$	13 – 12	38212.1856 (40)	–1.6	—	
$14_{1,13} - 13_{1,12}$	14 – 13	38212.1856 (40)	–1.6	—	
$14_{1,13} - 13_{1,12}$	15 – 14	38212.1856 (40)	–1.6	—	

Table 1—Continued

$J' - J''$	$F' - F''$	I		II	
		Frequency	$o - c$	Frequency	$o - c$
$15_{1,15} - 14_{1,14}$	14 - 13	40237.8887 (40)	-2.8	—	—
$15_{1,15} - 14_{1,14}$	15 - 14	40237.8887 (40)	-2.8	—	—
$15_{1,15} - 14_{1,14}$	16 - 15	40237.8887 (40)	-2.8	—	—
$15_{0,15} - 14_{0,14}$	14 - 13	40570.3867 (40)	2.7	—	—
$15_{0,15} - 14_{0,14}$	15 - 14	40570.3867 (40)	2.7	—	—
$15_{0,15} - 14_{0,14}$	16 - 15	40570.3867 (40)	2.7	—	—