

Supplementary Materials for

Full-dimensional quantum mechanics calculations for the tunneling behavior of HOCO dissociation to H+CO₂

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Table S1. Energy and lifetimes of lifetime-convergent vibrational states of the HOCO system

Table S2. Energy and lifetimes of lifetime-convergent vibrational states of the HOCO system in the energy region of 6400-6500 cm⁻¹ (arranged by the lifetimes)

Supplementary Materials

A total of 1500 states were obtained by current quantum calculation. The lifetimes of these resonances were calculated based on the estimated widths obtained using the filter diagonalization method after the Chebyshev propagator. Statistically, lifetimes for 1237 states were obtained altogether in the present work. The energy and lifetimes of these states are listed in Table S1. These resonances were assigned based on exact eigenvalues and wavefunctions. It should be noted that some high-energy states cannot be assigned because of the complex coupling and delocalization of wavefunctions.

Table S1. Energy and lifetimes of lifetime-convergent vibrational states of the HOCO system

Energy	Lifetime	<i>trans</i>	<i>cis</i>	Energy	Lifetime	<i>trans</i>	<i>cis</i>
1122.111	4.16E-03		5 ¹	4139.8733	4.71E-03		
1582.916	4.77E-03		6 ²	4165.0888	2.84E-03		2 ²
1861.931	4.88E-03			4184.4556	2.42E-03		5 ⁴ 3 ¹
2154.512	3.27E-03		5 ¹ 4 ¹	4283.2289	2.67E-03	6 ⁴ 5 ¹ 2 ¹	
2452.498	4.61E-03	5 ⁴		4304.9306	3.25E-03		
2458.2911	5.20E-03	5 ¹ 2 ¹		4305.8079	2.91E-03		
2765.3271	3.23E-03		6 ² 5 ²	4339.2042	2.81E-04		5 ³ 4 ²
2817.4391	4.67E-03		4 ¹ 3 ¹	4357.9422	1.80E-03		
3108.1461	4.89E-03	6 ⁴ 5 ²		4370.3341	2.68E-03		
3389.6047	5.15E-03		6 ² 2 ¹	4371.4064	4.28E-03	6 ² 4 ¹ 3 ²	
3438.0099	4.95E-03			4384.3796	4.23E-03		6 ² 5 ¹ 4 ¹ 3 ¹
3463.7175	5.22E-03		6 ⁴ 4 ¹	4391.9795	2.62E-03		
3653.0671	4.72E-03	5 ¹ 3 ¹ 2 ¹		4398.7892	1.79E-03		
3662.1	2.97E-03	6 ⁴ 5 ¹ 3 ¹		4407.2074	2.16E-03		5 ¹ 4 ² 3 ¹
3753.9112	3.06E-03		5 ² 4 ²	4452.9171	4.23E-03		
3778.4923	5.83E-03	6 ⁶ 3 ²		4468.4465	4.34E-03	5 ¹ 4 ² 2 ¹	
3857.5671	4.36E-03	6 ⁶ 5 ²		4524.1453	1.36E-04		5 ⁵ 4 ¹
3877.5943	3.44E-03	4 ² 2 ¹		4529.3689	2.63E-04		5 ² 4 ¹ 2 ¹
3928.617	2.85E-03		5 ⁴ 4 ¹	4537.9986	1.39E-05		6 ² 5 ⁵
3965.8913	3.24E-03		1 ¹	4555.3735	9.21E-04		5 ¹ 1 ¹
3969.9056	5.06E-03			4556.4938	2.00E-03		6 ² 4 ³
3997.3308	3.39E-03		5 ² 4 ¹ 3 ¹	4563.0808	3.72E-03		
4024.1228	5.26E-03	6 ² 5 ³ 3 ¹		4580.8031	2.60E-03		
4077.694	3.00E-03	4 ¹ 3 ¹ 2 ¹		4588.6637	5.26E-04		5 ³ 4 ¹ 3 ¹
4082.1207	2.89E-03		6 ² 3 ²	4594.5903	9.44E-04	6 ² 1 ¹	
4117.5173	1.09E-03		5 ⁶	4605.8084	2.28E-03		

Energy	Lifetime	<i>trans</i>	<i>cis</i>	Energy	Lifetime	<i>trans</i>	<i>cis</i>
4609.6447	2.79E-03		4 ⁴	5050.788	3.42E-03		
4628.2467	2.66E-03			5051.649	4.20E-03		
4632.174	3.52E-03		6 ² 5 ¹ 3 ²	5060.122	5.27E-03		
4643.818	1.99E-03		6 ⁰ 5 ¹ 4 ¹ 3 ²	5093.238	3.76E-03	6 ⁴ 5 ² 4 ¹	
4663.455	4.62E-03	6 ² 2 ²		5096.159	3.59E-03		
4668.735	2.30E-03			5114.764	7.44E-05	6 ² 5 ¹ 3 ³	
4676.117	4.87E-03	5 ⁶ 4 ¹		5115.304	8.79E-05		
4701.249	8.68E-04			5120.872	1.29E-03		
4705.197	3.23E-03	6 ² 5 ⁶		5128.573	1.24E-05		5 ⁶ 4 ¹
4720.898	5.46E-04	6 ⁴ 5 ³ 4 ¹		5134.298	6.10E-05		5 ³ 2 ¹
4722.583	1.68E-04		5 ⁷	5137.256	1.33E-04		
4739.828	2.72E-03			5146.453	2.57E-05		5 ² 1 ¹
4742.384	3.14E-04			5147.147	1.83E-03		6 ² 2 ²
4746.213	1.75E-04		5 ² 4 ³	5155.857	6.58E-05		4 ¹ 2 ²
4750.656	1.09E-03			5159.1182	7.23E-04		6 ² 5 ⁶
4753.886	2.99E-04			5162.5746	5.89E-04		
4765.822	1.06E-03		5 ² 4 ²	5164.7738	3.38E-03	5 ¹ 4 ¹ 3 ³	
4780.872	1.81E-03			5170.3826	1.40E-04		
4784.333	2.10E-04		5 ⁵ 3 ¹	5171.6121	8.73E-04		
4790.177	2.90E-03			5172.5914	1.67E-04		
4793.525	5.55E-04		5 ² 3 ¹ 2 ¹	5181.467	5.40E-05		
4810.497	1.01E-03		4 ³ 3 ¹	5182.2806	5.98E-04		
4846.583	7.33E-04		5 ³ 3 ²	5183.7432	2.18E-05		5 ⁴ 4 ¹ 3 ¹
4863.245	4.93E-03			5195.0962	2.40E-04		
4898.49	3.50E-03			5200.0442	5.72E-04	6 ⁴ 4 ¹ 3 ²	
4927.462	1.62E-05		5 ⁴ 4 ²	5200.6299	3.94E-04		
4936.969	5.60E-04			5205.2999	1.18E-03		
4945.095	9.74E-05		6 ² 5 ⁴ 4 ¹	5206.5671	8.43E-04		6 ² 5 ⁴ 3 ¹
4948.086	2.06E-03			5209.0315	2.56E-04		6 ¹ 3 ¹ 1 ¹
4960.464	3.39E-04			5211.1119	9.70E-04		
4970.136	4.84E-03			5217.273	3.78E-03	6 ² 5 ³ 3 ²	
4974.551	4.47E-03	6 ² 5 ¹ 4 ¹ 3 ²		5220.473	1.82E-03		
4987.388	7.65E-05		5 ² 4 ² 3 ¹	5235.1615	1.55E-04		5 ² 4 ¹ 3 ²
4991.213	1.35E-03	6 ⁶ 5 ² 3 ¹		5240.4958	2.01E-03		
4999.429	3.83E-04		4 ¹ 1 ¹	5254.6052	5.16E-03		
5001.961	1.33E-04		6 ² 5 ² 4 ¹ 3 ¹	5259.7179	1.29E-03		
5008.376	4.78E-03			5269.4644	5.63E-03	4 ⁴ 3 ¹	
5029.276	3.22E-03	6 ² 4 ⁴		5270.6518	2.13E-03		4 ¹ 3 ³
5032.376	2.50E-03			5271.9498	1.78E-03		
5033.261	4.97E-03			5280.6405	2.84E-03		
5037.227	5.89E-04		4 ² 3 ²	5291.7104	2.29E-03		
5044.555	2.74E-03			5294.1604	4.01E-03		

Energy	Lifetime	<i>trans</i>	<i>cis</i>	Energy	Lifetime	<i>trans</i>	<i>cis</i>
5300.1184	1.38E-04			5494.348	2.02E-04		
5300.3252	1.53E-04			5501.268	8.30E-04	6 ⁰⁵ 14 ³ 2 ¹	
5311.5043	3.27E-03	6 ⁴⁴ 13 ²		5502.579	3.92E-04		
5315.7628	3.00E-03	6 ⁴³ 3		5505.902	3.92E-04		
5323.8488	1.64E-05		5 ⁸	5508.507	3.30E-04		
5326.8496	8.52E-06		6 ²⁴ 2 ² 1	5509.108	6.70E-04		
5327.9539	8.23E-06		6 ²⁵ 3 ⁴ 2	5510.856	2.09E-03	6 ⁶⁴ 13 ³	
5330.9331	2.69E-05	6 ⁴⁵ 4 ⁴ 1		5520.099	1.09E-06		6 ⁰⁵ 5 ⁴ 2
5335.2656	4.29E-04			5522.316	7.05E-05		
5337.5089	3.89E-05		6 ²⁵ 14 ³	5524.291	8.57E-06		
5339.9332	1.37E-04		6 ²³ 3	5526.231	1.64E-04	6 ⁴⁵ 4 ³ 1	
5350.6335	2.02E-04		6 ⁴⁵ 14 ¹ 3 ¹	5531.239	1.83E-04	6 ⁰⁵ 9	
5355.0534	1.06E-04		6 ⁴⁵ 2 ³ 2	5532.077	1.27E-03	6 ⁴² 2	
5361.0477	1.25E-04		6 ⁰⁴ 3 ² 1	5534.385	1.26E-03		6 ⁰³ 4 ⁴
5365.636	7.65E-04			5537.911	2.49E-04		
5368.2862	1.55E-03	6 ⁴⁵ 2 ³ 2		5549.648	1.96E-04		6 ²⁴ 4 ⁴
5369.7092	2.84E-04			5552.022	5.35E-04	6 ⁴⁵ 14 ³	
5375.7426	1.13E-04		5 ¹⁴ 3 ³ 1	5552.976	3.24E-05		
5381.5082	9.04E-05		5 ⁴³ 2	5565.595	4.90E-05	6 ⁶⁵ 1	
5384.3347	7.74E-05			5568.769	1.52E-03		6 ⁴⁵ 3 ³ 1
5391.5181	8.93E-06		6 ²⁵ 3 ⁴ 2	5569.421	2.15E-03	6 ²⁴ 2 ³ 3	
5395.7166	1.39E-04	6 ²⁵ 2 ⁴ 2 ³ 1		5572.037	1.32E-04	6 ⁶⁴ 3	
5396.6386	4.50E-05		5 ⁶³ 1	5574.399	4.26E-06		6 ⁰⁵ 3 ⁴ 2 ³ 1
5398.094	2.73E-04	6 ⁸³ 2		5576.354	2.32E-03	6 ⁰⁵ 14 ² 3 ²	
5408.0808	3.06E-04		5 ¹⁴ 3 ³ 1	5580.835	2.92E-06		6 ⁰⁵ 14 ¹ 1 ¹
5409.9069	9.13E-04	6 ²⁵ 14 ² 2 ¹		5585.066	1.97E-04		
5411.056	5.65E-04		5 ¹³ 2 ² 1	5586.936	5.68E-05		6 ²⁵ 2 ⁴ 1 ³ 1
5416.215	3.92E-04		6 ²⁵ 14 ² 3 ¹	5589.981	1.96E-04	6 ⁴⁵ 6	
5417.999	9.54E-04			5591.401	7.80E-04		6 ²⁵ 5 ⁴ 1
5421.125	4.85E-03	4 ⁶³ 2		5596.928	1.90E-04		5 ¹⁴ 2 ³ 2
5422.57	1.81E-03	4 ³³ 2		5597.351	4.84E-04		
5425.712	1.67E-04	6 ⁸⁵ 2 ³ 1		5599.453	1.12E-03	6 ²⁵ 2 ⁴ 1 ³ 2	
5430.461	3.36E-04		6 ⁴⁵ 2 ² 1	5604.386	1.12E-04	6 ⁶⁵ 2 ² 1	
5432.053	1.05E-03	5 ²³ 1 ² 1		5613.886	8.65E-05		
5438.992	1.73E-03	6 ⁴⁵ 2 ³ 2		5614.076	2.75E-04	6 ²⁵ 2 ⁴ 1 ³ 2	
5443.786	9.28E-05			5618.453	2.33E-04		
5445.661	3.82E-03			5618.975	3.30E-04		
5453.286	1.48E-04		3 ¹² 2	5620.554	1.36E-03	6 ²⁴ 1 ² 2	
5460.37	3.86E-03	5 ⁷³ 1		5622.2131	8.95E-04	6 ²³ 4	
5461.336	5.95E-04			5623.5322	1.32E-04		
5480.102	1.31E-03		5 ²³ 2	5637.0791	3.92E-04	6 ²⁵ 3 ⁴ 1 ² 1	
5492.855	7.09E-04			5638.2516	1.11E-03		

Energy	Lifetime	<i>trans</i>	<i>cis</i>	Energy	Lifetime	<i>trans</i>	<i>cis</i>
5641.1143	1.12E-03			5808.7204	2.50E-04		
5646.4752	1.44E-03		6 ² 4 ¹ 3 ¹ 2 ¹	5810.6474	4.59E-05		
5649.1786	5.85E-04	6 ² 5 ¹ 4 ⁴		5814.938	1.93E-05	6 ⁴ 5 ¹ 4 ¹ 3 ²	6 ² 5 ³ 3 ²
5655.4066	2.34E-03	6 ⁶ 5 ⁵		5818.109	1.34E-04		6 ² 5 ⁵ 3 ¹
5657.2431	5.10E-04			5821.3244	2.51E-05		6 ² 5 ⁴ 2 ¹
5660.5339	2.42E-04	6 ⁴ 5 ¹ 4 ² 3 ¹		5823.3415	1.22E-03		
5661.6721	3.25E-04		6 ² 5 ¹ 4 ¹ 3 ²	5826.7126	8.90E-05	6 ² 5 ³ 2 ²	
5667.5141	2.54E-03	6 ² 5 ⁴ 4 ¹ 3 ¹		5829.1459	2.22E-05		
5673.7838	4.33E-04	6 ⁶ 5 ³ 3 ¹		5829.393	5.70E-06		5 ³ 4 ¹ 3 ²
5687.9845	1.15E-03	6 ⁶ 3 ¹ 2 ¹		5830.331	1.40E-03	6 ² 5 ² 1 ¹	
5689.2077	3.78E-04	6 ⁶ 5 ² 2 ¹		5831.797	3.21E-03	6 ² 3 ¹ 1 ¹	
5692.6283	6.29E-04	4 ¹ 3 ¹		5836.089	1.33E-04		6 ² 5 ³ 4 ¹ 3 ²
5694.3793	6.79E-04			5839.517	1.14E-04		
5698.7112	2.88E-04			5842.636	5.36E-04	6 ² 5 ⁶ 3 ¹	
5702.8885	2.37E-06			5849.257	5.92E-04	5 ¹ 4 ⁴ 3 ¹	
5705.5386	6.79E-06			5855.722	2.74E-04		6 ² 5 ¹ 3 ³
5720.1111	4.02E-04			5857.27	3.08E-04		
5723.2107	1.46E-06		5 ⁷ 4 ¹	5861.072	7.18E-04		
5725.9601	1.87E-06		6 ² 5 ⁷	5864.495	1.20E-04		
5726.3499	6.86E-06	6 ² 5 ² 3 ³		5868.844	4.28E-04		
5729.1212	6.87E-06			5869.883	2.21E-04	5 ³ 4 ¹ 3 ¹ 2 ¹	
5731.7717	2.22E-06			5872.977	3.61E-04		5 ¹ 4 ¹ 3 ³
5738.2274	1.93E-06		5 ³ 1 ¹	5877.022	7.56E-04		
5741.7732	8.91E-05	6 ⁶ 4 ² 3 ¹		5878.876	2.75E-04	6 ⁴ 4 ¹ 3 ¹ 2 ¹	
5745.8064	2.24E-05		5 ¹ 3 ¹ 1 ¹	5883.873	1.11E-04	6 ² 5 ¹ 4 ³ 1	
5751.2946	3.73E-04		6 ⁴ 4 ² 3 ¹	5885.764	2.86E-04		6 ⁴ 4 ¹ 3 ²
5755.0994	2.16E-05			5889.534	1.90E-04		
5770.4595	5.13E-05			5890.36	2.77E-04	6 ⁶ 5 ² 4 ¹ 3 ¹	
5770.9131	9.62E-06			5892.658	1.27E-04	6 ² 5 ² 2 ²	
5776.7002	1.69E-05			5893.992	6.28E-04		
5778.948	5.40E-05			5898.399	6.84E-04	4 ⁴ 2 ¹	
5780.5683	7.68E-06			5899.46	4.77E-04	6 ⁴ 5 ⁵ 4 ¹	
5781.3732	2.91E-05	6 ² 5 ² 2 ²		5903.148	2.02E-04		
5785.01	7.96E-04	3 ⁵		5903.678	1.53E-03		
5786.9297	9.79E-05		4 ⁴ 3 ¹	5907.347	3.55E-06	6 ² 5 ² 2 ²	
5787.7115	3.24E-06		6 ² 5 ² 4 ³	5908.405	2.62E-07		5 ⁴ 4 ³
5789.2524	1.46E-05	6 ² 3 ¹ 2 ²		5910.937	7.39E-05		6 ⁴ 5 ² 4 ¹ 3 ¹
5791.9668	2.10E-06	6 ⁶ 5 ² 4 ²		5912.536	1.79E-05	6 ² 3 ¹ 2 ²	
5793.1649	5.52E-05	6 ² 5 ¹ 4 ³ 3 ¹		5922.295	7.50E-06		
5799.2127	5.01E-04			5924.176	3.85E-06		
5803.4222	9.43E-06		6 ² 5 ² 3 ¹ 2 ¹	5926.388	4.16E-06		
5806.7093	6.03E-04			5928.272	3.52E-06		

Energy	Lifetime	<i>trans</i>	<i>cis</i>	Energy	Lifetime	<i>trans</i>	<i>cis</i>
5929.717	3.47E-05		6 ⁴ 1 ¹	6052.7912	5.04E-05	6 ⁴ 3 ² 2 ¹	
5931.549	3.01E-05		6 ⁴ 5 ⁴ 4 ¹	6054.4766	3.25E-05	6 ⁶ 4 ¹ 3 ²	
5934.155	1.14E-05		6 ² 4 ¹ 3 ¹ 2 ¹	6058.5787	1.05E-04		
5936.153	9.23E-06		5 ⁹	6061.7224	3.57E-05		
5939.974	1.70E-04	6 ⁴ 4 ⁴		6063.9118	7.68E-05		
5942.545	6.45E-04	6 ⁴ 5 ¹ 3 ³		6066.7558	2.06E-04		
5945.953	2.15E-04	6 ² 4 ⁵		6067.0386	2.98E-04		
5951.138	1.05E-04			6068.4752	1.99E-04		
5954.588	4.27E-06		6 ⁴ 5 ² 4 ¹ 3 ¹	6069.2064	1.07E-03	5 ⁸ 3 ¹	
5958.881	1.28E-04	6 ⁶ 5 ² 4 ¹ 3 ¹		6078.0294	3.25E-05	5 ⁴ 1 ¹	
5961.228	1.74E-04	6 ² 5 ¹ 4 ² 3 ²		6081.1661	5.65E-05		
5964.496	3.18E-06		5 ² 4 ³ 3 ¹	6083.4569	2.31E-05		
5967.145	2.56E-05			6084.7362	4.74E-05	6 ⁴ 5 ¹ 1 ¹	
5968.027	4.49E-03	5 ⁴ 3 ³		6090.4314	4.66E-05		
5972.534	8.33E-06			6094.9551	1.50E-05		
5974.826	2.53E-06		6 ² 5 ² 4 ² 3 ¹	6097.8344	1.22E-05		6 ⁴ 5 ² 4 ¹ 3 ¹
5978.692	8.11E-05	5 ⁴ 4 ³ 3 ¹		6098.7036	7.36E-06		4 ³ 3 ²
5984.879	2.09E-04	5 ² 3 ¹ 1 ¹		6102.0412	1.51E-07		5 ⁶ 4 ²
5986.566	2.26E-05			6105.5332	1.64E-05		
5987.325	1.04E-03	3 ² 1 ¹		6106.7341	2.11E-05	5 ⁴ 2 ²	
5988.8559	9.60E-06			6109.2092	1.68E-05		
5991.7911	1.40E-04			6111.8347	5.45E-04	6 ² 5 ¹ 4 ¹ 3 ³	
5994.8319	1.78E-04			6115.0962	4.22E-05	5 ² 3 ¹ 2 ²	
5998.3932	1.48E-06		5 ⁷ 3 ¹	6115.9352	1.04E-05		
5998.9837	3.44E-05			6116.9817	4.04E-07		
6000.8406	3.37E-06			6120.4108	2.34E-04	3 ² 2 ²	
6004.9579	7.56E-06	6 ⁴ 4 ³ 3 ¹		6122.1261	4.00E-06		6 ⁴ 5 ⁴ 3 ¹
6006.4421	6.34E-06	6 ² 5 ¹ 4 ² 3 ²		6126.9766	2.76E-05		
6009.7738	8.23E-05	6 ² 5 ³ 4 ² 3 ¹		6129.2154	1.20E-05		
6013.9949	1.56E-03			6130.5154	1.95E-06		6 ² 4 ¹ 2 ²
6017.9881	5.24E-05	6 ⁶ 5 ¹ 4 ¹ 2 ¹		6132.7367	3.73E-06		5 ¹ 3 ⁴
6020.391	6.94E-04	5 ¹ 4 ³ 3 ²		6134.175	3.30E-05		5 ² 4 ¹ 1 ¹
6026.8322	5.17E-06		6 ⁴ 5 ⁶	6138.358	2.42E-05		
6031.0744	4.16E-05		4 ² 1 ¹	6143.255	1.28E-05		
6035.1063	1.16E-04			6143.584	2.37E-05		
6036.5712	1.43E-05	6 ⁴ 4 ³ 3 ¹		6145.17	3.07E-06		
6037.4503	1.63E-05	6 ² 4 ² 3 ¹ 2 ¹		6146.871	1.02E-06		6 ² 5 ⁶ 4 ¹
6039.0935	4.26E-06		6 ² 4 ² 3 ²	6149.037	1.64E-05		
6043.2237	1.77E-05			6153.97	1.95E-04	5 ¹⁰	
6044.393	8.20E-04			6157.43	2.28E-06		
6046.4688	2.30E-04			6158.674	2.08E-04		
6048.9429	2.47E-06			6160.771	6.25E-07		

Energy	Lifetime	<i>trans</i>	<i>cis</i>	Energy	Lifetime	<i>trans</i>	<i>cis</i>
6161.61	1.69E-06			6260.52	5.50E-05		
6163.417	4.49E-05			6262.316	3.99E-05		
6163.972	8.55E-07			6263.7598	2.91E-04	6 ⁶ 2 ²	
6169.224	1.30E-05	6 ⁶ 5 ² 3 ²		6269.8023	3.47E-05		
6170.481	2.14E-07		6 ⁴ 5 ² 3 ²	6273.2125	7.68E-06		
6171.578	1.49E-06	6 ² 5 ³ 4 ¹ 3 ²		6275.0405	2.13E-05		
6172.751	1.57E-06	5 ³ 4 ² 3 ²		6279.4569	1.01E-05		
6174.159	5.81E-07			6284.3222	4.52E-05	6 ⁶ 5 ¹ 4 ³	
6177.417	2.90E-06		6 ² 4 ² 2 ¹	6286.5927	9.58E-06		
6178.557	1.60E-05			6290.2974	2.45E-05		
6184.258	1.43E-06		6 ² 5 ² 1 ¹	6290.5198	6.99E-07		
6186.412	1.03E-04	6 ⁶ 1 ¹		6292.1345	6.15E-07	6 ⁶ 5 ¹ 4 ³	
6189.369	8.02E-05			6298.487	3.49E-07	6 ⁶ 5 ¹ 3 ¹ 2 ¹	
6193.299	1.62E-04	6 ² 5 ⁴ 4 ¹ 2 ¹		6301.1695	1.39E-07		6 ² 5 ¹ 4 ³ 3 ¹
6196.572	2.53E-04	6 ⁴ 5 ⁴ 4 ²		6302.0203	2.43E-07		6 ² 4 ³ 2 ¹
6197.826	8.95E-04	6 ⁶ 5 ² 3 ²		6305.9745	4.33E-05	6 ² 5 ² 4 ⁴	
6201.542	6.82E-06	6 ⁶ 5 ³ 2 ¹		6311.1656	2.03E-05		6 ² 5 ¹ 4 ¹ 3 ²
6202.474	3.35E-04	6 ² 5 ⁵ 4 ¹ 3 ¹		6312.4881	1.28E-05		6 ² 4 ¹ 3 ²
6203.639	2.03E-05	6 ⁴ 4 ² 3 ²		6319.4958	9.69E-07		
6204.757	1.83E-06		6 ² 5 ² 4 ¹ 3 ²	6320.9716	1.74E-07		5 ¹ 4 ⁴ 3 ¹
6206.896	1.68E-05		5 ² 1 ¹	6324.6614	9.53E-06		
6207.324	1.25E-04			6326.9455	7.09E-07	6 ⁴ 4 ¹ 3 ³	
6209.7	1.64E-05		6 ⁴ 5 ² 3 ²	6329.1411	7.93E-07		5 ⁴ 1 ¹
6211.523	7.99E-05			6330.0045	1.02E-06		
6212.007	3.04E-05			6330.8148	3.53E-07		
6214.684	2.90E-06		4 ² 3 ³	6333.7958	2.63E-06	6 ⁴ 4 ¹ 3 ³	
6215.501	9.41E-05	6 ² 4 ¹ 3 ² 2 ¹		6334.8475	4.74E-06		
6219.531	7.73E-05			6334.966	1.60E-05	6 ² 5 ³ 3 ³	
6221.817	1.36E-05			6336.5177	2.48E-05		
6222.901	1.02E-04	6 ² 5 ³ 4 ¹ 3 ²		6340.3066	2.38E-05		
6224.741	2.17E-04	6 ² 4 ⁴ 3 ¹		6344.4611	3.53E-05		
6229.239	2.99E-05	6 ² 5 ¹ 4 ¹ 2 ²		6348.1986	6.80E-06		
6235.85	1.54E-04		6 ² 4 ¹ 2 ²	6350.7952	5.42E-06		
6237.289	1.66E-04	6 ² 5 ¹ 4 ¹ 1 ¹		6353.4076	4.46E-07		
6238.973	2.19E-05		6 ² 5 ⁴ 4 ¹ 3 ¹	6354.1033	3.09E-06		
6242.031	2.40E-05			6356.1257	8.09E-06		
6242.952	1.08E-05			6356.8056	2.02E-06	6 ² 5 ² 4 ³ 3 ¹	
6245.792	1.39E-04			6357.646	7.52E-07		6 ² 4 ³ 2 ¹
6249.344	1.49E-05			6362.1869	6.07E-06		
6250.114	4.24E-05			6365.5552	7.31E-07		6 ² 5 ² 2 ²
6251.68	3.27E-04			6369.6511	1.28E-05		6 ² 5 ⁶ 3 ¹
6258.49	1.76E-04			6371.1746	2.71E-06		

Energy	Lifetime	<i>trans</i>	<i>cis</i>	Energy	Lifetime	<i>trans</i>	<i>cis</i>
6372.3235	5.11E-06			6460.805	1.57E-05		
6378.436	1.52E-05			6462.282	2.76E-05		
6379.5359	6.05E-06	6 ² 4 ² 3 ²		6466.214	1.07E-05		
6381.0089	9.90E-07			6467.828	2.30E-04		
6384.311	1.80E-05	6 ² 5 ¹ 4 ³ 2 ¹		6469.958	5.86E-06		
6386.3971	3.26E-04	6 ⁰ 5 ¹ 3 ⁵		6471.694	6.99E-06		
6387.7691	2.99E-06			6475.361	4.48E-05		
6389.813	6.68E-05			6477.194	9.86E-06	6 ⁶ 4 ² 2 ¹	
6390.0618	5.20E-07			6479.984	5.39E-05	6 ² 5 ¹ 4 ³ 2 ¹	
6391.7097	1.89E-06			6482.257	2.15E-04	6 ⁰ 5 ³ 4 ¹ 1 ¹	
6392.6852	9.58E-06			6483.124	5.66E-05		
6392.8147	1.92E-06			6486.45	2.17E-06		
6393.6974	2.19E-07		5 ⁶ 4 ¹ 3 ¹	6487.878	2.98E-05	6 ⁴ 4 ¹ 1 ¹	
6394.3583	1.71E-06			6489.014	2.06E-06	6 ⁰ 5 ¹ 4 ² 2 ¹	
6395.088	7.30E-07		5 ² 3 ¹ 1 ¹	6490.201	1.81E-05		4 ¹ 3 ⁴
6400.465	2.86E-05		6 ² 5 ³ 3 ¹ 2 ¹	6491.571	1.65E-07	5 ³ 3 ⁴	
6401.595	1.12E-06	6 ⁴ 5 ² 4 ¹ 3 ²		6492.824	5.17E-08		5 ⁵ 4 ³
6404.962	2.35E-06	6 ² 5 ² 3 ² 2 ¹		6494.256	1.17E-05		6 ² 5 ² 3 ³
6406.724	1.69E-06			6494.914	1.22E-07	6 ² 5 ⁴ 4 ² 3 ¹	
6409.411	3.63E-06			6498.51	4.11E-06		5 ⁴ 4 ¹ 3 ²
6415.555	1.57E-04	6 ² 5 ¹ 4 ³ 2 ¹		6499.8	2.28E-06	6 ⁴ 5 ² 3 ³	
6417.024	1.05E-04	6 ⁴ 3 ⁴		6501.571	9.11E-07		
6418.196	6.33E-07		6 ² 5 ⁴ 3 ²	6504.58	6.95E-07		5 ² 4 ³ 3 ¹
6421.555	3.36E-06	6 ⁴ 5 ¹ 4 ¹ 3 ¹ 2 ¹		6504.748	2.04E-06		
6423.159	3.22E-06		5 ² 4 ¹ 3 ³	6505.231	1.14E-05		
6423.74	1.63E-04			6507.752	2.47E-06		
6426.203	6.56E-06	6 ⁴ 5 ² 4 ³ 3 ¹		6509.4436	8.49E-07		
6428.474	4.04E-06			6512.4865	1.95E-05	6 ² 4 ² 3 ³	
6428.752	1.47E-06			6513.4179	1.25E-05		
6430.206	3.01E-05			6514.403	2.32E-05		
6433.849	6.02E-06		5 ¹ 4 ¹ 3 ² 2 ¹	6515.0814	5.22E-06		
6435.347	3.02E-06		3 ² 1 ¹	6516.4998	4.57E-06		6 ² 4 ⁵
6436.712	5.16E-05	6 ² 4 ³ 3 ²		6518.0012	2.75E-06		
6438.224	7.64E-05			6519.398	1.03E-05		
6442.145	6.21E-05			6526.2078	3.73E-06		
6444.91	1.50E-03	6 ² 5 ³ 1 ¹		6526.8756	2.03E-05		
6446.497	8.17E-05	6 ² 5 ⁵ 3 ²		6529.7472	4.32E-06		
6447.568	3.48E-05			6533.8507	1.87E-05		
6452.265	2.90E-05			6536.4702	4.92E-06		
6453.443	5.36E-05			6540.1549	6.50E-07		
6455.457	9.99E-06			6541.5491	4.28E-07		
6458.588	5.38E-05		5 ² 4 ¹ 3 ³	6544.3159	5.28E-07		

Energy	Lifetime	<i>trans</i>	<i>cis</i>	Energy	Lifetime	<i>trans</i>	<i>cis</i>
6546.554	1.70E-06			6623.883	4.35E-05		
6548.2584	1.18E-06			6625.844	5.72E-06		6 ²⁵ 14 ²³ 2
6549.9165	1.04E-06			6628.692	2.23E-06		
6551.1265	1.58E-07			6630.348	1.19E-05		
6553.1185	2.61E-07			6633.197	7.72E-06	5 ⁷³ 2	
6557.9763	4.53E-07	6 ⁴⁵ 2 ³³		6633.482	2.05E-05		
6559.2338	3.19E-06	6 ²⁴ 2 ³³		6636.648	5.07E-06		5 ⁴³ 3
6563.286	6.76E-07		6 ²⁵ 14 ²³ 3	6639.04	5.99E-04	5 ³³ 1 ¹	
6564.2147	2.49E-07			6639.265	1.13E-05	6 ²⁵ 4 ⁴ 2 ³ 1	
6565.8796	1.74E-06			6641.457	2.07E-06		
6566.4206	1.28E-04			6643.209	6.70E-04	6 ²⁴ 2 ¹ 1	
6569.2954	1.01E-05	6 ²⁵ 4 ⁴ 2 ³ 1		6644.515	1.77E-05	6 ⁶⁵ 2 ⁴ 1 ² 1	
6570.0095	2.97E-06			6650.89	2.36E-06	6 ²⁵ 2 ⁴ 2 ³ 2	
6573.2605	8.88E-06			6653.368	1.46E-06	5 ²⁴ 3 ³ 2	
6573.7396	7.85E-06	5 ⁵³ 3		6653.546	8.86E-07		
6573.9275	8.27E-06		5 ¹⁴ 2 ¹ 1	6657.666	4.94E-06		
6575.8243	1.48E-05			6657.943	2.94E-06		
6576.0177	1.08E-06			6661.006	1.00E-06		
6579.9063	7.34E-07			6662.249	1.21E-06		
6582.0184	5.10E-07			6671.288	1.83E-06	5 ⁹³ 1	
6582.8611	3.02E-07		6 ²⁵ 14 ²³ 2	6673.007	2.05E-07		
6586.7624	1.41E-05			6677.832	1.46E-06		
6587.8449	1.19E-04	6 ²⁵ 4 ³ 2 ² 1		6679.346	5.53E-08		
6589.4859	4.98E-05	5 ¹³ 2 ¹ 1		6680.188	3.20E-07		
6589.7456	1.28E-05			6682.263	3.60E-08	6 ⁶⁵ 14 ¹³ 2	
6591.5233	2.94E-06			6687.842	6.51E-07		
6592.8638	1.17E-05			6688.943	1.33E-06	4 ²³ 4	
6594.4713	1.12E-05			6692.437	4.24E-07		
6599.5679	5.46E-07	6 ²⁵ 2 ⁴ 2 ³ 2		6694.595	6.14E-07		
6600.2279	1.06E-07			6695.897	8.16E-07		
6606.8279	1.59E-05			6700.927	7.87E-06		
6607.5623	8.86E-06			6701.755	7.48E-08		
6609.4394	4.34E-06	6 ⁶⁴ 4		6703.341	1.19E-06		
6611.7598	6.67E-07			6703.778	6.71E-07	6 ⁴⁵ 2 ¹ 1	
6612.7574	1.31E-06			6705.246	3.88E-05	5 ²² 1 ¹	
6613.6631	1.38E-05			6706.817	1.77E-07		
6614.0798	5.90E-06			6707.061	1.37E-05		
6616.033	5.80E-06			6709.316	1.97E-07		
6619.331	1.66E-05			6710.816	8.06E-07	6 ²³ 5	
6621.59	4.81E-06			6713.113	8.88E-06		
6621.997	3.05E-05			6714.89	3.81E-06		
6623.027	5.80E-05	6 ²⁴ 1 ³ 4		6715.889	2.36E-06		

Energy	Lifetime	<i>trans</i>	<i>cis</i>	Energy	Lifetime	<i>trans</i>	<i>cis</i>
6717.028	1.03E-06			6801.8107	6.18E-07		
6719.513	1.29E-07			6803.374	2.30E-06		
6722.092	6.21E-06			6804.2907	6.60E-07		
6725.88	8.10E-05			6808.7925	3.99E-07		
6728.5	7.09E-07			6810.033	5.58E-07		
6730.154	3.45E-06			6811.4515	6.05E-07		
6732.533	3.63E-07			6815.3992	1.66E-06		
6737.04	9.39E-08			6816.2155	5.39E-06		
6739.2592	1.52E-06			6816.533	5.54E-07		
6741.3601	7.81E-07			6821.5549	9.51E-06		
6742.9152	1.63E-06			6822.0007	1.87E-06		
6743.6276	1.21E-06			6823.9745	4.58E-06		
6746.1039	4.46E-07			6825.6818	4.40E-06		
6748.4011	6.32E-08		6 ⁰⁵ 14 ³³ 2	6828.4929	1.91E-06		
6749.5997	6.89E-07		6 ⁰³ 5	6829.1944	8.68E-07		
6753.5672	3.33E-08		6 ⁰⁴ 5 ³ 1	6830.9968	8.11E-06		
6754.1842	5.95E-06	6 ²⁵ 24 ¹³ 3		6833.7458	1.20E-06		
6755.3615	9.26E-07			6835.9189	1.46E-05		
6756.4621	1.51E-06			6839.0601	5.33E-06		
6762.2126	6.98E-07			6839.9236	1.10E-06		
6763.8457	2.79E-07			6840.533	4.59E-06		
6764.6034	2.62E-06			6841.967	2.54E-05		
6766.591	4.65E-07			6843.707	1.28E-05		
6768.7202	3.03E-07			6843.99	1.22E-05		
6769.4776	1.08E-07			6846.537	1.12E-05		
6770.7407	3.47E-08			6848.102	8.22E-06		
6772.3242	1.25E-05			6850.275	3.67E-05		
6777.0281	9.78E-07			6853.408	1.77E-04		
6777.233	1.81E-06			6859.279	3.49E-06		
6780.0168	8.88E-08			6860.746	2.85E-06		
6780.7031	7.67E-07			6861.93	1.98E-06		
6782.2296	2.22E-06			6862.987	3.15E-04		
6785.6046	9.22E-07			6863.851	1.52E-04		
6786.0901	2.68E-06			6865.849	9.31E-06		
6787.6655	4.57E-07			6867.648	1.95E-06		
6790.2689	6.05E-07			6869.179	2.74E-06		
6791.64	3.30E-07			6872.959	1.42E-06		
6792.6556	1.90E-06			6876.772	1.20E-08		
6796.5321	3.73E-06			6878.708	4.15E-07		
6798.6644	1.18E-06			6880.854	8.76E-07		
6799.6316	3.60E-07			6882.001	2.31E-06		
6801.0135	6.56E-07			6883.086	6.00E-06		

Energy	Lifetime	<i>trans</i>	<i>cis</i>	Energy	Lifetime	<i>trans</i>	<i>cis</i>
6883.569	1.99E-06			6969.8708	2.18E-06		
6885.877	5.86E-06			6971.4809	1.73E-07		
6886.611	4.06E-06			6970.1576	1.16E-06		
6888.071	1.25E-07			6973.1487	9.27E-07		
6890.515	1.64E-06			6976.2101	3.52E-07		
6891.08	2.03E-07			6976.7645	9.44E-07		
6891.264	1.02E-06			6978.6414	9.29E-08		6 ² 4 ³ 3 ²
6895.506	3.38E-08			6979.9749	1.53E-07		
6897.318	7.18E-07			6983.3631	1.79E-07	5 ⁴ 4 ¹ 3 ²	
6899.681	3.60E-07			6985.1675	1.10E-06		
6902.378	4.45E-08		5 ² 4 ¹ 3 ³	6985.5766	8.38E-08		
6904.508	7.34E-08		6 ² 4 ⁴ 3 ¹	6987.7043	5.05E-07		
6908.792	2.04E-07		6 ⁴ 5 ² 4 ² 3 ¹	6989.6272	8.01E-05	6 ² 4 ⁶	
6911.965	1.08E-06			6991.0131	7.77E-08		
6915.577	8.44E-07			6995.0909	1.36E-07		
6919.896	1.05E-07			6997.6523	1.61E-06		
6921.648	2.26E-06	6 ² 5 ² 4 ¹ 2 ²		6999.069	1.77E-07		6 ² 4 ² 3 ²
6922.27	4.35E-08		5 ⁵ 1 ¹	7000.451 1	2.84E-05	6 ² 5 ³ 3 ² 2 ¹	
6924.179	2.39E-07			7002.1084	1.94E-07		
6924.73	5.69E-08		5 ² 4 ⁴ 3 ¹	7003.8151	1.01E-05		
6927.469	1.65E-06	6 ⁴ 4 ² 3 ¹ 2 ¹		7007.9998	5.06E-07		
6929.763	3.22E-06		6 ⁴ 4 ¹ 1 ¹	7009.011	1.36E-06		
6932.203	1.38E-07			7010.4645	1.64E-07		
6933.546	1.52E-07			7013.2987	5.63E-07		
6934.302	3.19E-07			7014.6462	5.27E-07	6 ⁴ 5 ⁵ 4 ¹ 3 ¹	
6935.765	1.84E-06			7018.5985	9.44E-07		
6938.464	7.58E-07			7020.0298	2.63E-06		
6940.169	3.64E-08		6 ² 5 ⁵ 4 ¹ 3 ¹	7021.3174	6.58E-07		
6941.172	2.68E-08		6 ² 5 ⁷ 3 ¹	7023.0057	4.93E-07		
6943.932	1.79E-06		6 ² 4 ⁴ 3 ¹	7024.829	1.12E-07		6 ² 4 ² 1 ¹
6944.96	1.13E-05			7026.1654	1.92E-06		
6946.794	1.15E-07			7027.9158	8.08E-07		
6947.7769	3.24E-06			7029.6083	2.50E-07		
6951.1619	1.01E-07			7032.2979	1.45E-06		
6953.2037	1.51E-06			7036.7218	4.62E-07		
6955.3871	6.62E-07			7038.8346	9.29E-07		6 ⁰ 4 ³ 1 ¹
6957.6916	1.41E-06			7039.1641	1.90E-06		
6959.2472	1.73E-05			7042.0866	3.24E-07		
6961.731	1.37E-06			7043.9652	6.82E-08		
6962.5545	2.34E-06			7045.8123	2.49E-06		
6964.4746	9.06E-07			7047.7435	2.07E-07	6 ⁴ 5 ² 4 ¹ 3 ¹ 2 ¹	

6967.8408	1.52E-06			7048.758	2.75E-07		
Energy	Lifetime	<i>trans</i>	<i>cis</i>	Energy	Lifetime	<i>trans</i>	<i>cis</i>
7050.9973	1.13E-07		6 ² 4 ² 1 ¹	7136.402	1.93E-07		
7052.5111	2.12E-07			7137.31	4.02E-08		
7054.752	5.10E-08			7138.894	1.71E-07		
7057.096	9.37E-08			7140.999	7.37E-07		
7059.437	8.44E-08			7143.173	1.25E-08		
7060.767	3.17E-07			7146.37	4.41E-07		
7061.821	3.11E-07			7148.962	5.89E-07		
7064.787	4.64E-08			7150.137	1.12E-06		
7065.412	2.09E-07			7153.615	1.99E-07		
7070.323	1.54E-07			7155.611	1.55E-07	6 ² 4 ² 3 ² 2 ¹	
7073.311	1.37E-08		5 ² 4 ⁴ 3 ¹	7156.425	6.22E-08		
7074.122	1.45E-07			7158.244	1.19E-07		6 ⁴ 5 ² 4 ¹ 3 ²
7074.854	3.42E-07			7161.613	8.84E-09		
7079.546	4.74E-08			7161.2669	5.31E-07		
7081.443	4.21E-07			7164.7215	1.32E-07		
7082.269	6.58E-07			7166.6059	1.34E-06		
7085.464	1.93E-07			7170.6188	2.09E-08		
7089.12	3.14E-07			7172.4028	1.48E-08		
7090.053	4.69E-07			7174.4268	3.38E-07		
7091.997	6.31E-07	6 ² 5 ¹ 4 ² 3 ³		7176.2061	1.50E-08		
7094.177	9.93E-07			7178.1717	6.53E-08		
7095.062	4.89E-07			7182.5514	3.73E-07		
7096.983	5.51E-08			7184.0826	8.42E-08		
7098.312	8.89E-07			7188.0578	1.03E-06	6 ² 5 ¹ 4 ² 1 ¹	
7099.755	2.21E-05			7188.6407	4.29E-07		1 ²
7101.365	4.07E-07		6 ⁴ 5 ² 1 ¹	7189.977	2.93E-07	6 ⁰ 5 ² 3 ² 1 ¹	
7102.002	3.79E-07			7192.0589	5.12E-07		
7104.555	2.85E-05	1 ²		7196.5171	1.92E-06		
7108.82	4.63E-06	6 ⁴ 5 ¹ 4 ¹ 2 ²		7197.9157	2.86E-07	6 ⁴ 5 ² 4 ¹ 3 ²	
7110.175	5.61E-07			7200.8343	2.24E-07	6 ² 4 ⁶	
7112.565	4.55E-07			7200.3076	3.19E-07		
7114.667	1.55E-07			7203.1146	1.16E-07		
7117.254	4.69E-07			7204.8682	7.03E-07		
7119.594	4.53E-07			7206.1686	3.21E-07		
7120.796	7.03E-08			7208.7867	1.01E-06		
7122.954	5.53E-07	6 ⁴ 5 ¹ 4 ¹ 1 ¹		7210.9326	4.05E-07		
7125.016	1.50E-07			7214.445	1.35E-06	6 ⁶ 3 ⁴	
7125.995	1.12E-07			7215.5368	5.23E-07		6 ⁴ 5 ² 4 ¹ 3 ²
7129.391	2.14E-07	5 ⁴ 4 ¹ 1 ¹		7217.6758	1.79E-06		6 ⁴ 3 ¹ 1 ¹
7130.243	4.13E-08			7224.4708	2.11E-07		
7132.75	1.02E-07			7221.3979	3.68E-08		

7134.134	5.39E-08			7222.3162	2.74E-07	6 ²⁵ 1 ⁴ 3 ⁴	
Energy	Lifetime	<i>trans</i>	<i>cis</i>	Energy	Lifetime	<i>trans</i>	<i>cis</i>
7226.8587	3.64E-08			7316.331	1.66E-06		
7228.8411	1.28E-07			7318.399	3.65E-07		
7231.5488	1.31E-08			7321.857	5.75E-08		
7233.0382	4.37E-07			7323.61	3.36E-08		
7234.046	3.78E-06	6 ⁴⁵ 3 ¹ 1		7325.463	1.18E-08		
7236.2967	1.13E-07			7327.596	2.07E-08		
7237.3478	4.04E-07	6 ⁶⁴ 1 ¹ 1		7329.767	1.35E-07	6 ⁰¹ 2 ²	
7239.4353	3.57E-07	6 ⁴⁵ 3 ¹ 11		7332.697	2.91E-08		
7240.5507	4.05E-07			7334.691	1.12E-07		
7247.3279	5.33E-07			7337.058	1.56E-06		
7250.0868	2.22E-07			7338.682	4.03E-09		
7251.9728	3.20E-07			7342.674	8.64E-09		
7253.9759	7.77E-08			7341.931	3.70E-08		
7257.1965	2.50E-08			7345.751	1.93E-08		
7259.54	4.93E-07			7346.803	2.38E-08		
7260.6216	2.81E-08			7348.879	8.22E-07		
7262.0892	3.65E-07			7353.818	2.37E-08		
7263.6432	1.11E-06			7355.061	3.80E-08		
7266.2941	1.42E-07	6 ⁴⁴ 3 ³ 2		7357.053	3.30E-08	6 ⁴⁵ 3 ² 2	
7268.8686	5.99E-07			7358.062	2.84E-07		
7271.3832	1.59E-07			7359.014	8.86E-09	6 ²⁴ 2 ² 1 ¹ 1	
7271.9508	6.52E-07			7361.499	1.31E-07		
7274.8851	3.23E-07			7364.094	2.85E-07		
7275.862	9.07E-09			7367.249	4.16E-07		
7278.5063	3.23E-09			7368.039	4.72E-07		
7279.011	4.99E-08			7370.612	1.08E-07		
7281.758	3.79E-08			7372.2	2.95E-07	6 ⁶⁵ 4 ³ 2	
7283.479	1.45E-06		6 ⁴⁴ 1 ³ 3	7374.359	4.99E-08		
7285.508	6.45E-07			7377.733	1.68E-08		
7288.564	6.85E-08			7379.866	3.69E-07	6 ²⁵ 1 ⁴ 2 ² 2	
7289.739	6.94E-08			7381.933	7.91E-08		
7291.501	3.46E-07			7384.949	3.29E-08		6 ²⁵ 2 ³ 1 ¹ 1
7292.898	5.85E-07			7389.875	2.01E-07	6 ⁰⁵ 1 ⁴ 3 ⁵	
7295.632	2.35E-06			7391.246	1.99E-07		
7297.186	3.46E-07			7392.748	3.15E-07		
7299.545	3.28E-07			7395.506	7.56E-07		
7302.02	6.47E-07			7397.676	1.88E-07		
7302.968	6.07E-07			7399.8358	2.45E-07		
7308.038	1.41E-07			7400.6274	1.76E-07		
7310.93	6.73E-08			7403.4219	1.25E-06		
7312.63	8.47E-08			7405.5142	4.29E-08		

7315.155	1.38E-07	6 ⁴ 5 ¹ 4 ² 2 ¹		7405.5142	4.29E-08		
Energy	Lifetime	<i>trans</i>	<i>cis</i>	Energy	Lifetime	<i>trans</i>	<i>cis</i>
7406.7231	3.56E-07			7494.8487	7.63E-09		
7409.1043	7.24E-09			7497.499	2.55E-08	6 ⁶ 4 ³ 2 ¹	
7411.2942	1.98E-08			7499.0074	3.38E-08	6 ⁶ 5 ² 2 ²	
7413.2624	8.39E-08			7500.9181	8.67E-08	6 ⁰ 4 ² 2 ¹ 1 ¹	
7416.1675	2.10E-07			7506.0263	8.73E-09		
7417.4025	1.41E-08			7506.5352	6.24E-09		
7420.079	3.73E-07			7510.8661	5.76E-09		
7421.5531	4.61E-08			7512.228	2.75E-08		
7423.4806	2.27E-08			7514.601	2.92E-08		
7426.6897	4.24E-07			7515.306	2.66E-08		
7429.1991	1.47E-06			7518.467	3.02E-08		
7431.0164	1.64E-08			7519.446	3.32E-08		
7432.3106	5.87E-08			7521.489	1.35E-08		
7433.6911	1.62E-06			7524.093	3.06E-09		
7437.2935	4.53E-08			7525.727	3.18E-08		
7438.6174	1.72E-07			7528.742	6.85E-09		
7441.1703	8.37E-07			7530.385	4.17E-08		
7441.9723	6.85E-09			7532.678	6.16E-08		
7443.7612	3.05E-09	6 ⁶ 5 ² 1 ¹		7533.467	6.87E-08		
7446.993	4.39E-07			7535.088	9.04E-08		
7449.0113	6.29E-08			7536.626	3.43E-07		
7452.2215	1.37E-05		6 ² 5 ⁴ 4 ¹ 3 ²	7539.698	2.43E-08		
7453.6654	2.88E-07			7540.669	7.22E-08		
7455.4168	2.61E-07			7544.341	5.76E-08		
7457.6325	1.18E-07			7545.508	5.38E-07		
7458.697	2.79E-07			7548.894	1.43E-07		
7460.9323	1.41E-07			7550.462	5.76E-07		
7464.4351	1.39E-07	6 ⁰ 5 ¹ 3 ⁶		7552.205	9.90E-08		
7466.3394	1.26E-07			7554.632	1.32E-07		
7469.4824	3.32E-07	6 ⁴ 4 ² 1 ¹		7556.992	1.41E-07		
7471.7669	2.07E-07	6 ² 5 ² 3 ¹ 1 ¹		7558.407	9.47E-08		
7472.6568	1.17E-07			7560.912	5.53E-08		
7473.8681	9.76E-08			7562.312	2.06E-08		
7476.6507	2.13E-06			7566.251	1.74E-07		
7477.8245	6.65E-07			7568.34	5.90E-08		
7480.3205	3.14E-07	6 ² 4 ¹ 2 ¹ 1 ¹		7570.38	5.28E-07		
7481.9387	3.56E-07		6 ⁴ 5 ¹ 4 ¹ 1 ¹	7572.53	7.74E-08		
7485.7037	5.70E-09			7575.808	5.44E-08		
7487.3569	2.42E-08			7577.797	1.32E-09		
7487.7125	5.24E-08	6 ² 5 ¹ 4 ¹ 3 ¹ 1 ¹		7579.356	2.31E-08		
7490.9309	1.90E-06			7581.571	7.66E-08		

7492.9967	2.84E-08			7585.881	1.87E-07		
Energy	Lifetime	<i>trans</i>	<i>cis</i>	Energy	Lifetime	<i>trans</i>	<i>cis</i>
7587.971	1.29E-06			7678.5691	6.67E-08		
7591.037	1.06E-07			7682.1152	3.54E-08		
7592.46	4.41E-07			7682.8995	1.18E-07		
7595.466	8.96E-08			7685.1153	1.24E-08		
7595.863	1.92E-08			7686.8623	3.57E-08		
7598.747	3.84E-09			7689.0903	2.75E-07	6 ⁴⁵ 2 ⁴ 1 ¹	
7600.968	2.12E-08			7690.9925	6.70E-08		
7602.02	3.85E-08			7692.691	2.14E-08		
7605.589	4.09E-07			7695.5277	2.64E-07		
7606.998	1.28E-07			7696.8934	3.89E-09		
7608.088	1.40E-08			7697.9104	1.99E-07		
7611.079	2.48E-07			7702.0283	6.94E-09	6 ⁰⁵ 5 ³ 4	
7611.775	1.04E-07			7706.6696	3.66E-07		
7614.144	5.03E-07			7707.613	6.25E-08		
7616.616	2.75E-08			7709.1092	1.82E-07		
7618.829	6.70E-09			7711.6969	1.51E-08		
7622.535	2.74E-08			7714.6971	1.96E-07		
7623.549	2.09E-09			7716.2167	4.80E-08		
7625.652	2.03E-08			7718.9624	1.10E-08		
7629.0157	3.98E-08			7719.902	1.62E-08		
7630.4593	3.21E-07			7721.9237	5.82E-07		
7631.2704	1.74E-08	6 ⁴⁴ 1 ³ 1 ¹		7723.4958	2.11E-08		
7632.9238	8.85E-08			7725.191	2.77E-07		
7635.4452	2.89E-07			7728.6346	4.94E-08		
7637.2557	1.59E-08			7731.7833	2.70E-07		
7639.0509	1.59E-08			7733.4009	8.93E-08		
7641.9411	7.24E-08			7735.4921	1.28E-08		
7644.2084	1.31E-08			7737.3203	3.14E-07		
7646.0354	6.03E-09			7739.9859	6.10E-09		
7647.9962	6.72E-09			7741.6069	3.64E-08		
7651.7288	4.15E-07			7742.4088	7.33E-09		
7652.5408	1.95E-09			7746.641	1.49E-08		
7654.4114	1.56E-08			7749.253	1.93E-09		
7656.2881	1.68E-07			7750.957	3.66E-08		
7658.5171	2.49E-07	6 ²³ 1 ² 1 ¹		7752.393	5.14E-09		
7661.506	2.07E-07			7755.122	1.35E-08		
7665.3089	4.21E-08			7757.738	1.24E-08		
7668.5756	7.69E-08			7759.792	9.33E-09	6 ²³ 6	
7671.6244	1.77E-08		6 ²⁴ 2 ⁵ 1 ¹	7761.548	8.38E-09		
7672.6739	5.17E-08	6 ²⁵ 1 ⁴ 2 ¹ 1 ¹		7763.017	1.37E-09		
7674.7542	2.30E-08			7764.395	2.59E-08		

7677.6909	6.69E-08			7766.557	5.65E-08		
Energy	Lifetime	<i>trans</i>	<i>cis</i>	Energy	Lifetime	<i>trans</i>	<i>cis</i>
7768.696	6.60E-08	6 ⁴ 5 ² 4 ¹ 1 ¹		7863.865	2.58E-08		
7770.915	2.20E-08			7865.4597	8.02E-08		
7771.76	3.28E-08			7868.954	1.65E-08		
7775.051	1.49E-08			7870.4944	1.55E-08		
7777.018	4.58E-09			7872.5096	1.46E-08		
7778.514	1.10E-08			7875.2897	1.72E-08		
7782.092	4.06E-08			7877.3055	3.54E-08		
7783.202	5.22E-08	6 ⁰ 5 ⁷ 3 ³		7880.0145	2.96E-08		
7790.215	3.61E-08			7881.4145	1.06E-07		
7790.781	2.89E-08			7884.2565	4.14E-09		
7792.816	3.73E-09	6 ⁴ 3 ² 1 ¹		7885.5108	2.31E-08		
7796.11	2.82E-08			7887.685	2.02E-08		
7797.043	1.53E-08			7890.2036	3.32E-08		
7798.465	2.58E-07	6 ² 4 ² 3 ¹ 1 ¹		7892.4267	1.10E-08		
7802.947	7.82E-08			7894.305	2.29E-08		
7804.155	2.07E-07			7896.1415	7.11E-08		
7806.001	2.85E-08			7897.5053	3.77E-09		
7807.238	4.01E-07			7899.6712	7.80E-09		
7809.452	1.29E-08			7902.7053	1.30E-08		
7812.315	2.14E-08			7905.2091	2.39E-08		
7813.949	3.06E-08			7905.8577	4.61E-08		
7815.45	1.15E-08			7909.5807	2.92E-09		
7818.729	5.50E-09			7913.8205	3.61E-08		
7819.642	6.74E-09			7914.4708	1.09E-09		
7823.927	1.66E-08			7916.156	8.41E-08		
7828.887	1.68E-07			7917.626	3.43E-08		
7830.533	3.98E-08			7920.3125	2.04E-09		
7833.351	3.98E-08			7922.0501	2.95E-08		
7835.442	9.94E-09	6 ² 4 ⁷		7924.1653	5.15E-10		6 ⁰ 4 ⁶ 3 ¹
7837.859	3.54E-09			7926.6631	4.89E-08		
7839.773	6.85E-08			7928.4226	1.14E-08		
7841.241	4.35E-09			7931.2447	7.60E-10		6 ² 5 ⁵ 4 ¹ 3 ²
7842.352	5.80E-08			7934.1241	1.64E-08		
7845.664	1.76E-07			7936.1875	1.48E-08	6 ⁴ 5 ¹ 2 ¹ 1 ¹	
7848.141	1.39E-07			7938.5427	2.87E-09		3 ⁶
7848.141	1.39E-07			7941.2008	5.89E-09		
7850.325	1.92E-09		6 ² 4 ⁵ 3 ¹	7944.2618	9.14E-08	6 ² 4 ¹ 3 ² 1 ¹	
7853.448	1.33E-09			7946.7949	2.12E-09		6 ² 5 ³ 3 ¹
7855.458	2.76E-09			7950.4061	2.52E-09	6 ⁴ 5 ⁴ 1 ¹	
7857.083	7.92E-09			7953.2568	7.61E-08		
7858.359	1.03E-08			7955.2323	5.32E-09		

7859.842	9.66E-09			7957.4124	5.50E-08		
Energy	Lifetime	<i>trans</i>	<i>cis</i>	Energy	Lifetime	<i>trans</i>	<i>cis</i>
7960.7984	9.54E-09						
7962.9296	1.68E-08						
7963.9461	1.51E-08						
7965.4183	2.27E-08						
7968.3717	5.72E-09						
7969.9883	5.12E-08						
7971.5926	8.44E-09						
7975.4842	4.35E-08						

Table S2. Energy and lifetimes of lifetime-convergent vibrational states of the HOCO system in the energy region of 6400-6500 cm⁻¹ (arranged by the lifetimes)

6492.8243	5.17E-08		6 ⁰ 5 ⁵ 4 ³	6494.2563	1.17E-05		6 ² 5 ² 3 ³
6494.9144	1.22E-07	6 ² 5 ⁴ 4 ² 3 ¹		6460.8052	1.57E-05		
6491.5709	1.65E-07	6 ⁰ 5 ³ 3 ⁴		6490.2014	1.81E-05		6 ⁰ 4 ¹ 3 ⁴
6418.1956	6.33E-07		6 ² 5 ⁴ 3 ²	6462.2816	2.76E-05		
6401.5953	1.12E-06	6 ⁴ 5 ² 4 ¹ 3 ²		6400.4652	2.86E-05		6 ² 5 ³ 3 ¹ 2 ¹
6428.7518	1.47E-06			6452.2654	2.90E-05		
6406.724	1.69E-06			6487.8783	2.98E-05	6 ⁴ 4 ¹ 1 ¹	
6489.0144	2.06E-06	6 ⁰ 5 ¹ 4 ⁴ 2 ¹		6430.2059	3.01E-05		
6486.4502	2.17E-06			6447.5676	3.48E-05		
6499.8004	2.28E-06	6 ⁴ 5 ² 3 ³		6475.3611	4.48E-05		
6404.962	2.35E-06	6 ² 5 ² 3 ² 2 ¹		6436.7116	5.16E-05	6 ² 4 ³ 3 ²	
6435.347	3.02E-06		6 ⁰ 3 ² 1 ¹	6453.4427	5.36E-05		
6423.1592	3.22E-06		6 ⁰ 5 ² 4 ¹ 3 ³	6458.5875	5.38E-05		6 ² 5 ² 3 ³
6421.5551	3.36E-06	6 ⁴ 5 ¹ 4 ¹ 3 ¹ 2 ¹		6479.9842	5.39E-05	6 ² 5 ¹ 4 ³ 2 ¹	
6409.4111	3.63E-06			6483.1242	5.66E-05		
6428.474	4.04E-06			6442.1448	6.21E-05		
6498.5101	4.11E-06		6 ⁰ 5 ⁴ 4 ¹ 3 ²	6438.2242	7.64E-05	6 ² 2 ¹ 1 ¹	
6469.9575	5.86E-06			6446.4966	8.17E-05	6 ² 5 ⁵ 3 ²	
6433.8493	6.02E-06		6 ⁰ 5 ¹ 4 ¹ 3 ² 2 ¹	6417.024	1.05E-04	6 ⁴ 3 ⁴	
6426.2033	6.56E-06	6 ⁴ 5 ² 4 ³ 3 ¹		6415.5546	1.57E-04	6 ² 5 ¹ 4 ³ 2 ¹	
6471.6938	6.99E-06			6423.7398	1.63E-04		
6477.194	9.86E-06	6 ⁶ 4 ² 2 ¹		6482.2567	2.15E-04	6 ⁰ 5 ³ 4 ¹ 1 ¹	
6455.4565	9.99E-06			6467.8275	2.30E-04		
6466.2144	1.07E-05			6444.9102	1.50E-03	6 ² 5 ³ 1 ¹	