

Gábor Czák³

List of Publications by Year in descending order

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110
papers

4,729
citations

81839

39
h-index

106281

65
g-index

110
all docs

110
docs citations

110
times ranked

1892
citing authors

#	ARTICLE	IF	CITATIONS
1	High-dimensional ab initio potential energy surfaces for reaction dynamics calculations. <i>Physical Chemistry Chemical Physics</i> , 2011, 13, 8094.	1.3	252
2	The fourth age of quantum chemistry: molecules in motion. <i>Physical Chemistry Chemical Physics</i> , 2012, 14, 1085-1106.	1.3	196
3	Quasiclassical trajectory calculations of correlated product distributions for the F+CHD ₃ (v ₁ =,1) reactions using an <i>ab initio</i> potential energy surface. <i>Journal of Chemical Physics</i> , 2009, 131, 244302.	1.2	190
4	Toward black-box-type full- and reduced-dimensional variational (ro)vibrational computations. <i>Journal of Chemical Physics</i> , 2009, 130, 134112.	1.2	180
5	Dynamics of the Reaction of Methane with Chlorine Atom on an Accurate Potential Energy Surface. <i>Science</i> , 2011, 334, 343-346.	6.0	167
6	On equilibrium structures of the water molecule. <i>Journal of Chemical Physics</i> , 2005, 122, 214305.	1.2	157
7	Revealing a double-inversion mechanism for the F ⁺ +CH ₃ Cl SN ₂ reaction. <i>Nature Communications</i> , 2015, 6, 5972.	5.8	134
8	Accurate <i>ab initio</i> potential energy surface, dynamics, and thermochemistry of the F+CH ₄ ⁺ HF+CH ₃ reaction. <i>Journal of Chemical Physics</i> , 2009, 130, 084301.	1.2	130
9	Influence of the leaving group on the dynamics of a gas-phase SN ₂ reaction. <i>Nature Chemistry</i> , 2016, 8, 151-156.	6.6	116
10	CH Stretching Excitation Steers the F Atom to the CD Bond in the F + CHD ₃ Reaction. <i>Journal of the American Chemical Society</i> , 2009, 131, 17534-17535.	6.6	108
11	Theoretical Study of the Validity of the Polanyi Rules for the Late-Barrier Cl + CHD ₃ Reaction. <i>Journal of Physical Chemistry Letters</i> , 2012, 3, 3416-3419.	2.1	106
12	Ab-Initio-Based Potential Energy Surfaces for Complex Molecules and Molecular Complexes. <i>Journal of Physical Chemistry Letters</i> , 2010, 1, 1866-1874.	2.1	97
13	Reaction Dynamics of Methane with F, O, Cl, and Br on ab Initio Potential Energy Surfaces. <i>Journal of Physical Chemistry A</i> , 2014, 118, 2839-2864.	1.1	96
14	Vibrational energy levels with arbitrary potentials using the Eckart-Watson Hamiltonians and the discrete variable representation. <i>Journal of Chemical Physics</i> , 2007, 127, 084102.	1.2	90
15	Experimental and Theoretical Investigations of Energy Transfer and Hydrogen-Bond Breaking in the Water Dimer. <i>Journal of the American Chemical Society</i> , 2012, 134, 15430-15435.	6.6	89
16	Mode Selectivity for a <i>Central-Barrier</i> Reaction: Eight-Dimensional Quantum Studies of the O(³ P) + CH ₄ ⁺ OH + CH ₃ Reaction on an Ab Initio Potential Energy Surface. <i>Journal of Physical Chemistry Letters</i> , 2012, 3, 3776-3780.	2.1	87
17	Dynamics of the O(3P) + CHD ₃ (v _{CH} = 0,1) reactions on an accurate ab initio potential energy surface. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2012, 109, 7997-8001.	3.3	78
18	Accurate <i>ab initio</i> potential energy surface, thermochemistry, and dynamics of the Cl(2P, 2P _{3/2}) + CH ₄ ⁺ HCl + CH ₃ and H + CH ₃ Cl reactions. <i>Journal of Chemical Physics</i> , 2012, 136, 044307.	1.2	76

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19	Rotational mode specificity in the Cl + CHD ₃ → HCl + CD ₃ reaction. <i>Journal of Chemical Physics</i> , 2014, 141, 074310.	1.2	75
20	A practical method to avoid zero-point leak in molecular dynamics calculations: Application to the water dimer. <i>Journal of Chemical Physics</i> , 2010, 132, 164103.	1.2	73
21	Dynamics of the F [•] + CH ₃ Cl → Cl [•] + CH ₃ F S _N 2 reaction on a chemically accurate potential energy surface. <i>Chemical Science</i> , 2013, 4, 4362.	3.7	70
22	Variational vibrational calculations using high-order anharmonic force fields. <i>Molecular Physics</i> , 2004, 102, 2411-2423.	0.8	65
23	Mode-Specific S _N 2 Reaction Dynamics. <i>Journal of Physical Chemistry Letters</i> , 2016, 7, 3322-3327.	2.1	63
24	Assigning quantum labels to variationally computed rotational-vibrational eigenstates of polyatomic molecules. <i>Journal of Chemical Physics</i> , 2010, 133, 034113.	1.2	61
25	Automating the Development of High-Dimensional Reactive Potential Energy Surfaces with the <sc>robosurfer</sc> Program System. <i>Journal of Chemical Theory and Computation</i> , 2020, 16, 51-66.	2.3	60
26	Gaussian Binning of the Vibrational Distributions for the Cl + CH ₄ (v = 0, 1) → H + CH ₃ Cl (n = 1, 2, 3, 4) → H ₂ + CH ₃ Reactions. <i>Journal of Physical Chemistry A</i> , 2012, 116, 7467-7473.	1.1	55
27	Dynamics and Novel Mechanisms of S _N 2 Reactions on ab Initio Analytical Potential Energy Surfaces. <i>Journal of Physical Chemistry A</i> , 2017, 121, 9005-9019.	1.1	55
28	Chapter 9 An Active Database Approach to Complete Rotational-Vibrational Spectra of Small Molecules. <i>Annual Reports in Computational Chemistry</i> , 2007, 3, 155-176.	0.9	54
29	High-level ab initio potential energy surface and dynamics of the F [•] + CH ₃ I S _N 2 and proton-transfer reactions. <i>Chemical Science</i> , 2017, 8, 3164-3170.	3.7	53
30	Bridging Theory with Experiment: A Benchmark Study of Thermally Averaged Structural and Effective Spectroscopic Parameters of the Water Molecule. <i>Journal of Physical Chemistry A</i> , 2009, 113, 11665-11678.	1.1	52
31	Double-Inversion Mechanisms of the X [•] + CH ₃ Y [X, Y = F, Cl, Br, I] S _N 2 Reactions. <i>Journal of Physical Chemistry A</i> , 2015, 119, 3134-3140.	1.1	49
32	Deciphering Front-Side Complex Formation in S _N 2 Reactions via Dynamics Mapping. <i>Journal of Physical Chemistry Letters</i> , 2017, 8, 2917-2923.	2.1	49
33	An ab initio spin-orbit-corrected potential energy surface and dynamics for the F + CH ₄ and F + CHD ₃ reactions. <i>Physical Chemistry Chemical Physics</i> , 2011, 13, 8306.	1.3	47
34	Communication: Experimental and theoretical investigations of the effects of the reactant bending excitations in the F+CHD ₃ reaction. <i>Journal of Chemical Physics</i> , 2010, 133, 131101.	1.2	46
35	Experimental and Theoretical Investigations of Energy Transfer and Hydrogen-Bond Breaking in Small Water and HCl Clusters. <i>Accounts of Chemical Research</i> , 2014, 47, 2700-2709.	7.6	46
36	Accurate ab initio determination of spectroscopic and thermochemical properties of mono- and dichlorocarbenes. <i>Physical Chemistry Chemical Physics</i> , 2005, 7, 2881.	1.3	43

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37	Conformers of gaseous threonine. <i>Molecular Physics</i> , 2009, 107, 761-775.	0.8	43
38	Atomistic dynamics of elimination and nucleophilic substitution disentangled for the $F\hat{a}^{\sim} + CH_3CH_2Cl$ reaction. <i>Nature Chemistry</i> , 2021, 13, 977-981.	6.6	43
39	Anchoring the Absolute Proton Affinity Scale. <i>Journal of Chemical Theory and Computation</i> , 2008, 4, 1220-1229.	2.3	42
40	Quasiclassical Trajectory Studies of the $O(^3P) + CX_4(v=0, 1) \hat{a}^{\sim} + OX(v) + CX_3(n=1, 2, 3, 4)$ [X = H and D] Reactions on an Ab Initio Potential Energy Surface. <i>Journal of Physical Chemistry A</i> , 2013, 117, 6409-6420.	1.1	41
41	On one-dimensional discrete variable representations with general basis functions. <i>Journal of Chemical Physics</i> , 2003, 119, 10512-10518.	1.2	39
42	Direct mapping of the angle-dependent barrier to reaction for $Cl + CHD_3$ using polarized scattering data. <i>Nature Chemistry</i> , 2017, 9, 1175-1180.	6.6	37
43	Stretching vibration is a spectator in nucleophilic substitution. <i>Science Advances</i> , 2018, 4, eaas9544.	4.7	37
44	Accurate <i>ab initio</i> potential energy surface, thermochemistry, and dynamics of the $Br(2P, 2P_{3/2}) + CH_4 \hat{a}^{\sim} HBr + CH_3$ reaction. <i>Journal of Chemical Physics</i> , 2013, 138, 134301.	1.2	36
45	On the Choice of the Ab Initio Level of Theory for Potential Energy Surface Developments. <i>Journal of Physical Chemistry A</i> , 2014, 118, 646-654.	1.1	36
46	Communication: Probing the entrance channels of the $X + CH_4 \hat{a}^{\sim} HX + CH_3$ (X = F, Cl, Br, I) reactions via photodetachment of $X\hat{a}^{\sim}CH_4$. <i>Journal of Chemical Physics</i> , 2011, 134, 191102.	1.2	35
47	Rethinking the $X^{\sim} + CH_3Y$ [X = OH, SH, CN, NH_2 , PH_2 ; Y = F, Cl, Br, I] S_N2 reactions. <i>Physical Chemistry Chemical Physics</i> , 2019, 21, 7924-7931.	1.3	35
48	Proton affinity and enthalpy of formation of formaldehyde. <i>International Journal of Quantum Chemistry</i> , 2009, 109, 2393-2409.	1.0	33
49	On the efficiency of treating singularities in triatomic variational vibrational computations. The vibrational states of H_3 up to dissociation. <i>Physical Chemistry Chemical Physics</i> , 2010, 12, 8373.	1.3	33
50	Communication: Quasiclassical trajectory calculations of correlated product-state distributions for the dissociation of $(H_2O)_2$ and $(D_2O)_2$. <i>Journal of Chemical Physics</i> , 2011, 135, 151102.	1.2	33
51	Accurate <i>ab initio</i> potential energy surface, thermochemistry, and dynamics of the $F\hat{a}^{\sim} + CH_3F$ S_N2 and proton-abstraction reactions. <i>Journal of Chemical Physics</i> , 2015, 142, 244301.	1.2	33
52	Translational energy dependence of the $Cl + CH_4(v=0, 1)$ reactions: a joint crossed-beam and quasiclassical trajectory study. <i>Molecular Physics</i> , 2012, 110, 1617-1626.	0.8	32
53	The methylene saga continues: Stretching fundamentals and zero-point energy of CH_2 . <i>Journal of Molecular Structure</i> , 2006, 780-781, 283-294.	1.8	31
54	Zero-point energy constrained quasiclassical, classical, and exact quantum simulations of isomerizations and radial distribution functions of the water trimer using an <i>ab initio</i> potential energy surface. <i>Chemical Physics Letters</i> , 2010, 500, 217-222.	1.2	31

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55	Quantum Dynamics Study of the $F + CH_4 \rightarrow HF + CH_3$ Reaction on an Ab Initio Potential Energy Surface. <i>Journal of Physical Chemistry A</i> , 2013, 117, 7124-7130.	1.1	30
56	Theory Finally Agrees with Experiment for the Dynamics of the $Cl + C_2H_6$ Reaction. <i>Journal of Physical Chemistry Letters</i> , 2020, 11, 4762-4767.	2.1	28
57	Benchmark ab Initio Characterization of the Inversion and Retention Pathways of the $OH + CH_3Y$ [Y = F, Cl, Br, I] S_N2 Reactions. <i>Journal of Physical Chemistry A</i> , 2018, 122, 5773-5780.	1.1	26
58	Accurate ab Initio Structure, Dissociation Energy, and Vibrational Spectroscopy of the F^-CH_4 Anion Complex. <i>Journal of Physical Chemistry A</i> , 2008, 112, 7466-7472.	1.1	25
59	Benchmark ab Initio Characterization of the Complex Potential Energy Surface of the $F + CH_3CH_2Cl$ Reaction. <i>Journal of Physical Chemistry A</i> , 2017, 121, 2847-2854.	1.1	25
60	Benchmark ab Initio Characterization of the Complex Potential Energy Surface of the $Cl + CH_3I$ Reaction. <i>Journal of Physical Chemistry A</i> , 2017, 121, 5748-5757.	1.1	23
61	Effects of the Level of Electronic Structure Theory on the Dynamics of the $F + CH_3I$ Reaction. <i>Journal of Physical Chemistry A</i> , 2018, 122, 3353-3364.	1.1	22
62	Detailed benchmark ab initio mapping of the potential energy surfaces of the $X + C_2H_6$ [X = F, Cl, Br, I] reactions. <i>Physical Chemistry Chemical Physics</i> , 2019, 21, 396-408.	1.3	20
63	On the development of a gold-standard potential energy surface for the $OH + CH_3I$ reaction. <i>Physical Chemistry Chemical Physics</i> , 2020, 22, 3775-3778.	1.3	20
64	Quasiclassical Trajectory Study of the Rotational Mode Specificity in the $O(^3P) + CHD_3$ ($v=0, 1$, $J_K=0$) \rightarrow OH + CD_3 Reactions. <i>Journal of Physical Chemistry A</i> , 2014, 118, 11683-11687.	1.1	17
65	Benchmark ab initio and dynamical characterization of the stationary points of reactive atom + alkane and S_N2 potential energy surfaces. <i>Physical Chemistry Chemical Physics</i> , 2020, 22, 4298-4312.	1.3	17
66	Full-dimensional MRCI-F12 potential energy surface and dynamics of the $F(2P_{3/2}) + C_2H_6 \rightarrow HF + C_2H_5$ reaction. <i>Journal of Chemical Physics</i> , 2020, 153, 064305.	1.2	17
67	Uncovering an oxide ion substitution for the $OH + CH_3F$ reaction. <i>Chemical Science</i> , 2021, 12, 14369-14375.	3.7	17
68	Benchmark ab Initio Characterization of the Complex Potential Energy Surfaces of the $X + NH_2Y$ [X, Y = F, Cl, Br, I] Reactions. <i>Journal of Physical Chemistry A</i> , 2018, 122, 1886-1895.	1.1	16
69	Mode-Specific Quasiclassical Dynamics of the $F + CH_3I$ S_N2 and Proton-Transfer Reactions. <i>Journal of Physical Chemistry A</i> , 2018, 122, 8143-8151.	1.1	16
70	Benchmark ab initio characterization of the abstraction and substitution pathways of the OH + CH ₄ /C ₂ H ₆ reactions. <i>Physical Chemistry Chemical Physics</i> , 2020, 22, 14560-14569.	1.3	16
71	Mode-specific multi-channel dynamics of the $F + CHD_2Cl$ reaction on a global ab initio potential energy surface. <i>Journal of Chemical Physics</i> , 2016, 145, 134303.	1.2	15
72	Flame Inhibition Chemistry: Rate Coefficients of the Reactions of HBr with CH_3 and OH Radicals at High Temperatures Determined by Quasiclassical Trajectory Calculations. <i>Energy & Fuels</i> , 2018, 32, 10100-10105.	2.5	15

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73	Treating singularities present in the Sutcliffe-Tennyson vibrational Hamiltonian in orthogonal internal coordinates. <i>Journal of Chemical Physics</i> , 2005, 122, 024101.	1.2	14
74	Adiabatic Jacobi corrections on the vibrational energy levels of H ₂ ⁺ isotopologues. <i>Journal of Chemical Physics</i> , 2009, 130, 134314.	1.2	14
75	Exact quantum dynamics background of dispersion interactions: case study for CH ₄ -Ar in full (12) dimensions. <i>Physical Chemistry Chemical Physics</i> , 2020, 22, 2792-2802.	1.3	14
76	Numerical separation of the front-side attack and double-inversion retention pathways of SN ₂ reactions. <i>Chemical Physics Letters</i> , 2020, 755, 137780.	1.2	14
77	Facilitated inversion complicates the stereodynamics of an S _N 2 reaction at nitrogen center. <i>Chemical Science</i> , 2021, 12, 5410-5418.	3.7	14
78	First-Principles Reaction Dynamics beyond Six-Atom Systems. <i>Journal of Physical Chemistry A</i> , 2021, 125, 2385-2393.	1.1	14
79	Vibrational mode-specificity in the dynamics of the Cl + C ₂ H ₆ → HCl + C ₂ H ₅ reaction. <i>Journal of Chemical Physics</i> , 2021, 155, 114303.	1.2	14
80	Correlated Dynamics of the O(³ P) + CHD ₃ ($\langle i \rangle v \langle /i \rangle = 0$) Reaction: A Joint Crossed-Beam and Quasiclassical Trajectory Study. <i>Journal of Physical Chemistry A</i> , 2015, 119, 7190-7196.	1.1	13
81	Uncovering the role of the stationary points in the dynamics of the F(²) + CH ₃ I reaction. <i>Physical Chemistry Chemical Physics</i> , 2019, 21, 1578-1586.	1.3	13
82	Conformers of dehydrogenated glycine isomers. <i>Journal of Computational Chemistry</i> , 2020, 41, 2001-2014.	1.5	13
83	Finite basis representations with nondirect product basis functions having structure similar to that of spherical harmonics. <i>Journal of Chemical Physics</i> , 2006, 124, 014110.	1.2	12
84	A paradox of grid-based representation techniques: accurate eigenvalues from inaccurate matrix elements. <i>Journal of Mathematical Chemistry</i> , 2012, 50, 636-651.	0.7	12
85	Vibrational mode-specific dynamics of the F(²) + CH ₃ CH ₂ Cl multi-channel reaction. <i>Physical Chemistry Chemical Physics</i> , 2022, 24, 8166-8181.	1.3	12
86	Reduced-Dimensional Quantum Computations for the Rotational-Vibrational Dynamics of F(²) + CH ₄ and F(²) + CH ₂ D ₂ . <i>Journal of Physical Chemistry A</i> , 2013, 117, 6975-6983.	1.1	11
87	Communication: Direct comparison between theory and experiment for correlated angular and product-state distributions of the ground-state and stretching-excited O(3P) + CH ₄ reactions. <i>Journal of Chemical Physics</i> , 2014, 140, 231102.	1.2	11
88	ManyHF: A pragmatic automated method of finding lower-energy Hartree-Fock solutions for potential energy surface development. <i>Journal of Chemical Physics</i> , 2022, 156, 071101.	1.2	11
89	Does the Cl + CH ₄ → H + CH ₃ Cl Reaction Proceed via Walden Inversion?. <i>Journal of Physical Chemistry A</i> , 2017, 121, 9415-9420.	1.1	10
90	High-Level-Optimized Stationary Points for the F(²)(H ₂ O) + CH ₃ I System: Proposing a New Water-Induced Double-Inversion Pathway. <i>Journal of Physical Chemistry A</i> , 2019, 123, 454-462.	1.1	10

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91	High-Level Systematic Ab Initio Comparison of Carbon- and Silicon-Centered $S_{\text{N}}2$ Reactions. <i>Journal of Physical Chemistry A</i> , 2021, 125, 9645-9657.	1.1	10
92	Rotational Mode Specificity in the $F^{\bullet} + CH_3Y$ [Y = F and Cl] $S_{\text{N}}2$ Reactions. <i>Journal of Physical Chemistry A</i> , 2015, 119, 12231-12237.	1.1	9
93	Benchmark <i>ab initio</i> proton affinity of glycine. <i>Physical Chemistry Chemical Physics</i> , 2021, 23, 9663-9671.	1.3	9
94	Vibrational mode-specific dynamics of the $F(2P_{3/2}) + C_2H_6 \rightarrow HF + C_2H_5$ reaction. <i>Journal of Chemical Physics</i> , 2021, 155, 154302.	1.2	9
95	Use of a nondirect-product basis for treating singularities in triatomic rotational-vibrational calculations. <i>Physical Chemistry Chemical Physics</i> , 2007, 9, 3407.	1.3	8
96	Temperature-Dependent, Effective Structures of the $^{14}NH_3$ and $^{14}ND_3$ Molecules. <i>Journal of Physical Chemistry A</i> , 2012, 116, 4356-4362.	1.1	8
97	Benchmark <i>ab initio</i> stationary-point characterization of the complex potential energy surface of the multi-channel $Cl + CH_3NH_2$ reaction. <i>Physical Chemistry Chemical Physics</i> , 2021, 23, 10347-10356.	1.3	7
98	A benchmark <i>ab initio</i> study of the complex potential energy surfaces of the $OH^{\bullet} + CH_3CH_2Y$ [Y = F, Cl, Br, I] reactions. <i>Physical Chemistry Chemical Physics</i> , 2021, 23, 13526-13534.	1.3	7
99	$S_{\text{N}}2$ Reactions with an Ambident Nucleophile: A Benchmark Ab Initio Study of the $CN^{\bullet} + CH_3Y$ [Y = F, Cl, Br, and I] Systems. <i>Journal of Physical Chemistry A</i> , 2022, 126, 889-900.	1.1	7
100	Adiabatic Jacobi corrections for H_2^+ -like systems. <i>Journal of Chemical Physics</i> , 2007, 126, 024102.	1.2	6
101	Surprising Quenching of the Spin-Orbit Interaction Significantly Diminishes $H_2O^{\bullet}X$ [X = F, Cl, Br, I] Dissociation Energies. <i>Journal of Physical Chemistry A</i> , 2014, 118, 11956-11961.	1.1	6
102	Unconventional S_N2 retention pathways induced by complex formation: High-level dynamics investigation of the $NH_2^{\bullet} + CH_3I$ polyatomic reaction. <i>Journal of Chemical Physics</i> , 2022, 156, 184306.	1.2	6
103	Pathways for the $OH + Cl_2 \rightarrow HOCl + Cl$ and $HOCl + Cl \rightarrow HCl + ClO$ Reactions. <i>Journal of Physical Chemistry A</i> , 2015, 119, 7802-7809.	1.1	5
104	Dynamics of proton transfer from ArH^+ to CO. <i>International Journal of Mass Spectrometry</i> , 2019, 438, 175-185.	0.7	5
105	Rotational Mode Specificity in the $F^{\bullet} + CH_3I$ ($v = 0, v_{JK}$) $S_{\text{N}}2$ and Proton-Transfer Reactions. <i>Journal of Physical Chemistry A</i> , 2020, 124, 8943-8948.	1.1	5
106	Detailed quasiclassical dynamics of the $F^{\bullet} + CH_3Br$ reaction on an <i>ab initio</i> analytical potential energy surface. <i>Journal of Chemical Physics</i> , 2021, 155, 124301.	1.2	5
107	Benchmark <i>ab initio</i> proton affinity and gas-phase basicity of \pm alanine based on coupled-cluster theory and statistical mechanics. <i>Journal of Computational Chemistry</i> , 2022, 43, 19-28.	1.5	4
108	Rotational Mode-Specificity in the $Cl + C_2H_6 \rightarrow HCl + C_2H_5$ Reaction. <i>Journal of Physical Chemistry A</i> , 2022, 126, 2551-2560.	1.1	4

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109	Benchmark Ab Initio Characterization of the Abstraction and Substitution Pathways of the Cl + CH ₃ CN Reaction. Journal of Physical Chemistry A, 2022, 126, 2802-2810.	1.1	2
110	Conformers of gaseous threonine. , 0, .		1