Supporting information for

Is it possible to predict the stability of a crystal structure to the pressure influence? Quantum chemical study of the ibuprofen crystals

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List of contents

Table S1. Symmetry codes, binding types, interaction energies of the **monomeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under **ambient pressure**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
d1	**1-x,-y,1-z**	**-11.5**	**18.9**	**O–H…O, 1.85 Å, 176°**
d2	x,1/2-y,-1/2+z	-6.5	10.6	C–H…π, 2.86 Å, 166°
d3	x,1/2-y,1/2+z	-6.5	10.6	C–H…π, 2.86 Å, 166°
d4	x,3/2-y,-1/2+z	-6.0	9.8	non-specific
d5	x,3/2-y,1/2+z	-6.0	9.8	non-specific
d6	1-x,1-y,1-z	-5.8	9.6	non-specific
d7	2-x,1-y,1-z	-3.7	6.1	non-specific
d8	x,-1+y,z	-2.7	4.4	non-specific
d9	x,1+y,z	-2.7	4.4	non-specific
d10	2-x,-1/2+y,1/2-z	-2.2	3.6	non-specific
d11	2-x,1/2+y,1/2-z	-2.2	3.6	non-specific
d12	1-x,-1/2+y,3/2-z	-1.8	3.0	non-specific
d13	1-x,1/2+y,3/2-z	-1.8	3.0	non-specific
d14	2-x,2-y,1-z	-1.7	2.8	non-specific

Table S2. Symmetry codes, binding types, interaction energies of the **dimeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under **ambient pressure**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
dd1	1-x,-1-y,1-z	-10.7	10.6	non-specific
dd2	1-x,1-y,1-z	-10.7	10.6	non-specific
dd3	1-x,-1/2+y,1/2-z	-8.8	8.8	C–H…π, 2.86 Å, 166°
dd4	1-x,-1/2+y,3/2-z	-8.8	8.8	C–H…π, 2.86 Å, 166°
dd5	1-x,1/2+y,1/2-z	-8.8	8.8	C–H…π, 2.86 Å, 166°
dd6	1-x,1/2+y,3/2-z	-8.8	8.8	C–H…π, 2.86 Å, 166°
dd7	1-x,-3/2+y,1/2-z	-6.0	6.0	non-specific
dd8	1-x,-3/2+y,3/2-z	-6.0	6.0	non-specific
dd9	1-x,3/2+y,1/2-z	-6.0	6.0	non-specific
dd10	1-x,3/2+y,3/2-z	-6.0	6.0	non-specific
dd11	-x,-1-y,1-z	-3.8	3.8	non-specific
dd12	2-x,1-y,1-z	-3.8	3.8	non-specific
dd13	-x,-1/2+y,3/2-z	-2.2	2.2	non-specific
dd14	-x,1/2+y,3/2-z	-2.2	2.2	non-specific
dd15	2-x,-1/2+y,1/2-z	-2.2	2.2	non-specific
dd16	2-x,1/2+y,1/2-z	-2.2	2.2	non-specific
dd17	-x,-2-y,1-z	-1.7	1.7	non-specific
dd18	2-x,2-y,1-z	-1.7	1.7	non-specific

Table S3. Symmetry codes, binding types, interaction energies of the **monomeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **0.23 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
d1	**1-x,-y,1-z**	**-10.9**	**17.7**	**O–H…O, 1.80 Å, 176°**
d2	x,1/2-y,-1/2+z	-6.5	10.6	C–H…π, 2.77 Å, 165°
d3	x,1/2-y,1/2+z	-6.5	10.6	C–H…π, 2.77 Å, 165°
d4	x,3/2-y,-1/2+z	-6.1	10.0	non-specific
d5	x,3/2-y,1/2+z	-6.1	10.0	non-specific
d6	1-x,1-y,1-z	-5.6	9.1	non-specific
d7	2-x,1-y,1-z	-4.0	6.5	non-specific
d8	x,-1+y,z	-2.9	4.6	non-specific
d9	x,1+y,z	-2.9	4.6	non-specific
d10	2-x,-1/2+y,1/2-z	-2.2	3.6	non-specific
d11	2-x,1/2+y,1/2-z	-2.2	3.6	non-specific
d12	1-x,-1/2+y,3/2-z	-1.9	3.1	non-specific
d13	1-x,1/2+y,3/2-z	-1.9	3.1	non-specific
d14	2-x,2-y,1-z	-1.9	3.1	non-specific

Table S4. Symmetry codes, binding types, interaction energies of the **monomeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **0.60 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
d1	**1-x,-y,1-z**	**-10.9**	**16.8**	**O-H…O, 1.82 Å, 173°**
d2	x,3/2-y,-1/2+z	-6.8	10.5	non-specific
d3	x,3/2-y,1/2+z	-6.8	10.5	non-specific
d4	x,1/2-y,-1/2+z	-6.6	10.3	C-H…π, 2.69 Å, 164°
d5	x,1/2-y,1/2+z	-6.6	10.3	C-H…π, 2.69 Å, 164°
d6	1-x,1-y,1-z	-5.8	8.9	non-specific
d7	2-x,1-y,1-z	-4.2	6.5	non-specific
d8	x,-1+y,z	-3.0	4.6	non-specific
d9	x,1+y,z	-3.0	4.6	non-specific
d10	2-x,-1/2+y,1/2-z	-2.5	3.8	non-specific
d11	2-x,1/2+y,1/2-z	-2.5	3.8	non-specific
d12	2-x,2-y,1-z	-2.0	3.2	non-specific
d13	1-x,-1/2+y,3/2-z	-2.0	3.1	non-specific
d14	1-x,1/2+y,3/2-z	-2.0	3.1	non-specific

Table S5. Symmetry codes, binding types, interaction energies of the **monomeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **0.80 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
d1	**1-x,-y,1-z**	**-11.8**	**17.6**	**O-H…O, 1.78 Å, 172°**
d2	x,3/2-y,-1/2+z	-7.0	10.5	C…H, 2.85 Å
d3	x,3/2-y,1/2+z	-7.0	10.5	C…H, 2.85 Å
d4	x,1/2-y,-1/2+z	-6.7	10.0	C-H…π, 2.65 Å, 166°
d5	x,1/2-y,1/2+z	-6.7	10.0	C-H…π, 2.65 Å, 166°
d6	1-x,1-y,1-z	-5.7	8.5	non-specific
d7	2-x,1-y,1-z	-4.4	6.6	non-specific
d8	x,-1+y,z	-3.1	4.6	non-specific
d9	x,1+y,z	-3.1	4.6	non-specific
d10	2-x,-1/2+y,1/2-z	-2.6	3.9	non-specific
d11	2-x,1/2+y,1/2-z	-2.6	3.9	non-specific
d12	2-x,2-y,1-z	-2.1	3.2	H…H, 2.34 Å
d13	1-x,-1/2+y,3/2-z	-2.0	3.0	non-specific
d14	1-x,1/2+y,3/2-z	-2.0	3.0	non-specific

Table S6. Symmetry codes, binding types, interaction energies of the **monomeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **0.88 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
d1	**1-x,-y,1-z**	**-12.1**	**18.0**	**O-H…O, 1.82 Å, 172°**
d2	x,3/2-y,-1/2+z	-7.1	10.6	C…H, 2.85 Å
d3	x,3/2-y,1/2+z	-7.1	10.6	C…H, 2.85 Å
d4	x,1/2-y,-1/2+z	-6.6	9.8	C-H…π, 2.68 Å, 164°; C…H, 2.88 Å
d5	x,1/2-y,1/2+z	-6.6	9.8	C-H…π, 2.68 Å, 164°; C…H, 2.88 Å
d6	1-x,1-y,1-z	-5.6	8.3	non-specific
d7	2-x,1-y,1-z	-4.4	6.6	non-specific
d8	x,-1+y,z	-3.2	4.7	non-specific
d9	x,1+y,z	-3.2	4.7	non-specific
d10	2-x,-1/2+y,1/2-z	-2.6	3.8	non-specific
d11	2-x,1/2+y,1/2-z	-2.6	3.8	non-specific
d12	2-x,2-y,1-z	-2.2	3.2	non-specific
d13	1-x,-1/2+y,3/2-z	-2.0	3.0	non-specific
d14	1-x,1/2+y,3/2-z	-2.0	3.0	non-specific

Table S7. Symmetry codes, binding types, interaction energies of the **monomeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **1.70 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
d1	**1-x,-y,1-z**	**-12.2**	**17.9**	**O-H…O, 1.80 Å, 170°**
d2	x,3/2-y,-1/2+z	-7.5	10.9	C…H, 2.72 Å
d3	x,3/2-y,1/2+z	-7.5	10.9	C…H, 2.72 Å
d4	x,1/2-y,-1/2+z	-6.3	9.3	C-H…π, 2.63 Å, 163°; C…H, 2.80 Å
d5	x,1/2-y,1/2+z	-6.3	9.3	C-H…π, 2.63 Å, 163°; C…H, 2.80 Å
d6	1-x,1-y,1-z	-5.6	8.1	non-specific
d7	2-x,1-y,1-z	-4.7	6.9	non-specific
d8	x,-1+y,z	-3.2	4.7	non-specific
d9	x,1+y,z	-3.2	4.7	non-specific
d10	2-x,-1/2+y,1/2-z	-2.6	3.8	H…H, 2.21 Å
d11	2-x,1/2+y,1/2-z	-2.6	3.8	H…H, 2.21 Å
d12	2-x,2-y,1-z	-2.3	3.4	H…H, 2.28 Å
d13	1-x,-1/2+y,3/2-z	-2.1	3.1	non-specific
d14	1-x,1/2+y,3/2-z	-2.1	3.1	non-specific

Table S8. Symmetry codes, binding types, interaction energies of the **monomeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **1.89 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
d1	**1-x,-y,1-z**	**-10.7**	**16.1**	**O-H…O, 1.77 Å, 170°**
d2	x,3/2-y,-1/2+z	-7.5	11.2	C…H, 2.70 Å
d3	x,3/2-y,1/2+z	-7.5	11.2	C…H, 2.70 Å
d4	x,1/2-y,-1/2+z	-6.4	9.5	C-H…π, 2.55 Å, 164°; C…H, 2.81 Å
d5	x,1/2-y,1/2+z	-6.4	9.5	C-H…π, 2.55 Å, 164°; C…H, 2.81 Å
d6	1-x,1-y,1-z	-5.3	8.0	O-H…O, 2.43 Å, 125°
d7	2-x,1-y,1-z	-4.7	7.1	non-specific
d8	x,-1+y,z	-3.2	4.9	non-specific
d9	x,1+y,z	-3.2	4.9	non-specific
d10	2-x,-1/2+y,1/2-z	-2.7	4.0	H…H, 2.23 Å
d11	2-x,1/2+y,1/2-z	-2.7	4.0	H…H, 2.23 Å
d12	2-x,2-y,1-z	-2.3	3.4	H…H, 2.22 Å
d13	1-x,-1/2+y,3/2-z	-2.0	3.0	non-specific
d14	1-x,1/2+y,3/2-z	-2.0	3.0	non-specific

Table S9. Symmetry codes, binding types, interaction energies of the **monomeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **2.32 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
d1	**1-x,-y,1-z**	**-11.7**	**17.5**	**O-H…O, 1.80 Å, 168°**
d2	x,3/2-y,-1/2+z	-7.5	11.3	C…H, 2.70 Å, 2.88 Å; H…H, 2.33 Å
d3	x,3/2-y,1/2+z	-7.5	11.3	C…H, 2.70 Å, 2.88 Å; H…H, 2.33 Å
d4	x,1/2-y,-1/2+z	-5.8	8.7	C-H…π, 2.48 Å, 164°; C…H, 2.73 Å;
d5	x,1/2-y,1/2+z	-5.8	8.7	C-H…π, 2.48 Å, 164°; C…H, 2.73 Å
d6	1-x,1-y,1-z	-5.4	8.1	O-H…O, 2.43 Å, 124°
d7	2-x,1-y,1-z	-4.8	7.1	non-specific
d8	x,-1+y,z	-3.2	4.9	non-specific
d9	x,1+y,z	-3.2	4.9	non-specific
d10	2-x,-1/2+y,1/2-z	-2.7	4.0	H…H, 2.19 Å
d11	2-x,1/2+y,1/2-z	-2.7	4.0	H…H, 2.19 Å
d12	2-x,2-y,1-z	-2.4	3.5	H…H, 2.22 Å
d13	1-x,-1/2+y,3/2-z	-2.0	3.1	non-specific
d14	1-x,1/2+y,3/2-z	-2.0	3.1	non-specific

Table S10. Symmetry codes, binding types, interaction energies of the **monomeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **2.65 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
d1	**1-x,-y,1-z**	**-10.0**	**15.5**	**O-H…O, 1.78 Å, 168°**
d2	x,3/2-y,-1/2+z	-7.5	11.6	C…H, 2.60 Å, 2.83 Å; H…H, 2.32 Å
d3	x,3/2-y,1/2+z	-7.5	11.6	C…H, 2.60 Å, 2.83 Å; H…H, 2.32 Å
d4	x,1/2-y,-1/2+z	-5.9	9.1	C-H…π, 2.54 Å, 162°; C…H, 2.73 Å; C…C, 3.41 Å
d5	x,1/2-y,1/2+z	-5.9	9.1	C-H…π, 2.54 Å, 162°; C…H, 2.73 Å; C…C, 3.41 Å
d6	1-x,1-y,1-z	-5.2	8.0	O-H…O, 2.41 Å, 124°
d7	2-x,1-y,1-z	-4.8	7.5	non-specific
d8	x,-1+y,z	-3.2	5.0	non-specific
d9	x,1+y,z	-3.2	5.0	non-specific
d10	2-x,-1/2+y,1/2-z	-2.6	4.1	H…H, 2.16 Å, 2.34 Å
d11	2-x,1/2+y,1/2-z	-2.6	4.1	H…H, 2.16 Å, 2.34 Å
d12	2-x,2-y,1-z	-2.4	3.7	H…H, 2.22 Å
d13	1-x,-1/2+y,3/2-z	-1.9	3.0	non-specific
d14	1-x,1/2+y,3/2-z	-1.9	3.0	non-specific

Table S11. Symmetry codes, binding types, interaction energies of the **monomeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **3.46 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
d1	**1-x,-y,1-z**	**-11.9**	**18.4**	**O-H…O, 1.76 Å, 167°**
d2	x,3/2-y,-1/2+z	-7.4	11.5	C…H, 2.53 Å, 2.75 Å, 2.85 Å; H…H, 2.27 Å, 2.32 Å
d3	x,3/2-y,1/2+z	-7.4	11.5	C…H, 2.53 Å, 2.75 Å, 2.85 Å; H…H, 2.27 Å, 2.32 Å
d4	x,1/2-y,-1/2+z	-5.1	7.9	C-H…π, 2.43 Å, 163°; C…H, 2.63 Å; C…C, 3.31 Å, 3.39 Å
d5	x,1/2-y,1/2+z	-5.1	7.9	C-H…π, 2.43 Å, 163°; C…H, 2.63 Å; C…C, 3.31 Å, 3.39 Å
d6	1-x,1-y,1-z	-5.0	7.7	O-H…O, 2.41 Å, 123°
d7	2-x,1-y,1-z	-4.9	7.6	non-specific
d8	x,-1+y,z	-3.3	5.1	C…C, 3.40 Å
d9	x,1+y,z	-3.3	5.1	C…C, 3.40 Å
d10	2-x,-1/2+y,1/2-z	-2.5	3.9	H…H, 2.10 Å, 2.31 Å; C…H, 2.85 Å, 2.88 Å
d11	2-x,1/2+y,1/2-z	-2.5	3.9	H…H, 2.10 Å, 2.31 Å; C…H, 2.85 Å, 2.88 Å
d12	2-x,2-y,1-z	-2.4	3.7	H…H, 2.15 Å; C…H, 2.87 Å
d13	1-x,-1/2+y,3/2-z	-1.9	3.0	non-specific
d14	1-x,1/2+y,3/2-z	-1.9	3.0	non-specific

Table S12. Symmetry codes, binding types, interaction energies of the **monomeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **4.00 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
d1	**1-x,-y,1-z**	**-9.9**	**15.9**	**O-H…O, 1.74 Å, 167°**
d2	x,3/2-y,-1/2+z	-7.3	11.7	C…H, 2.50 Å, 2.76 Å, 2.85 Å, 2.86 Å; H…H, 2.25 Å, 2.25 Å
d3	x,3/2-y,1/2+z	-7.3	11.7	C…H, 2.50 Å, 2.76 Å, 2.85 Å, 2.86 Å; H…H, 2.25 Å, 2.25 Å
d4	1-x,1-y,1-z	-5.1	8.3	O-H…O, 2.39 Å, 124°; O-H…O, 2.41 Å, 122°
d5	x,1/2-y,-1/2+z	-5.0	8.0	C-H…π, 2.40 Å, 163°; C…H, 2.61 Å; C…C, 3.31 Å, 3.34 Å
d6	x,1/2-y,1/2+z	-5.0	8.0	C-H…π, 2.40 Å, 163°; C…H, 2.61 Å; C…C, 3.31 Å, 3.34 Å
d7	2-x,1-y,1-z	-4.9	7.9	non-specific
d8	x,-1+y,z	-3.2	5.1	C…C, 3.33 Å; C…H, 2.86 Å
d9	x,1+y,z	-3.2	5.1	C…C, 3.33 Å; C…H, 2.86 Å
d10	2-x,-1/2+y,1/2-z	-2.5	4.1	H…H, 2.11 Å, 2.29 Å; C…H, 2.84 Å
d11	2-x,1/2+y,1/2-z	-2.5	4.1	H…H, 2.11 Å, 2.29 Å; C…H, 2.84 Å
d12	2-x,2-y,1-z	-2.4	3.9	H…H, 2.13 Å; C…H, 2.84 Å
d13	1-x,-1/2+y,3/2-z	-1.9	3.0	non-specific
d14	1-x,1/2+y,3/2-z	-1.9	3.0	non-specific

Table S13. Symmetry codes, binding types, interaction energies of the **dimeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **0.23 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
dd1	x,-1+y,z	-10.8	10.5	non-specific
dd2	x,1+y,z	-10.8	10.5	non-specific
dd3	x,-1/2-y,-1/2+z	-8.9	8.7	C-H…π, 2.77 Å, 165°
dd4	x,-1/2-y,1/2+z	-8.9	8.7	C-H…π, 2.77 Å, 165°
dd5	x,1/2-y,-1/2+z	-8.9	8.7	C-H…π, 2.77 Å, 165°
dd6	x,1/2-y,1/2+z	-8.9	8.7	C-H…π, 2.77 Å, 165°
dd7	x,-3/2-y,-1/2+z	-6.2	6.0	non-specific
dd8	x,-3/2-y,1/2+z	-6.2	6.0	non-specific
dd9	x,3/2-y,-1/2+z	-6.2	6.0	non-specific
dd10	x,3/2-y,1/2+z	-6.2	6.0	non-specific
dd11	-1+x,-1+y,z	-4.1	3.9	non-specific
dd12	1+x,1+y,z	-4.1	3.9	non-specific
dd13	-1+x,-1/2-y,1/2+z	-2.2	2.2	non-specific
dd14	-1+x,1/2-y,1/2+z	-2.2	2.2	non-specific
dd15	1+x,-1/2-y,-1/2+z	-2.2	2.2	non-specific
dd16	1+x,1/2-y,-1/2+z	-2.2	2.2	non-specific
dd17	-1+x,-2+y,z	-1.9	1.9	non-specific
dd18	1+x,2+y,z	-1.9	1.9	non-specific

Table S14. Symmetry codes, binding types, interaction energies of the **dimeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **0.60 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
dd1	x,-1+y,z	-11.2	10.2	non-specific
dd2	x,1+y,z	-11.2	10.2	non-specific
dd3	x,-1/2-y,-1/2+z	-9.2	8.4	C-H…π, 2.69 Å, 164°
dd4	x,-1/2-y,1/2+z	-9.2	8.4	C-H…π, 2.69 Å, 164°
dd5	x,1/2-y,-1/2+z	-9.2	8.4	C-H…π, 2.69 Å, 164°
dd6	x,1/2-y,1/2+z	-9.2	8.4	C-H…π, 2.69 Å, 164°
dd7	x,-3/2-y,-1/2+z	-6.9	6.3	non-specific
dd8	x,-3/2-y,1/2+z	-6.9	6.3	non-specific
dd9	x,3/2-y,-1/2+z	-6.9	6.3	non-specific
dd10	x,3/2-y,1/2+z	-6.9	6.3	non-specific
dd11	-1+x,-1+y,z	-4.3	3.9	non-specific
dd12	1+x,1+y,z	-4.3	3.9	non-specific
dd13	-1+x,-1/2-y,1/2+z	-2.5	2.3	non-specific
dd14	-1+x,1/2-y,1/2+z	-2.5	2.3	non-specific
dd15	1+x,-1/2-y,-1/2+z	-2.5	2.3	non-specific
dd16	1+x,1/2-y,-1/2+z	-2.5	2.3	non-specific
dd17	-1+x,-2+y,z	-2.1	1.9	non-specific
dd18	1+x,2+y,z	-2.1	1.9	non-specific

Table S15. Symmetry codes, binding types, interaction energies of the **dimeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **0.80 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
dd1	x,-1+y,z	-11.3	10.0	non-specific
dd2	x,1+y,z	-11.3	10.0	non-specific
dd3	x,-1/2-y,1/2+z	-9.3	8.3	C-H…π, 2.65 Å, 166°
dd4	x,1/2-y,1/2+z	-9.3	8.3	C-H…π, 2.65 Å, 166°
dd5	x,1/2-y,-1/2+z	-9.3	8.3	C-H…π, 2.65 Å, 166°
dd6	x,-1/2-y,-1/2+z	-9.3	8.3	C-H…π, 2.65 Å, 166°
dd7	x,3/2-y,-1/2+z	-7.1	6.4	C…H, 2.85 Å
dd8	x,3/2-y,1/2+z	-7.1	6.4	C…H, 2.85 Å
dd9	x,-3/2-y,-1/2+z	-7.1	6.4	C…H, 2.85 Å
dd10	x,-3/2-y,1/2+z	-7.1	6.4	C…H, 2.85 Å
dd11	1+x,1+y,z	-4.5	4.0	non-specific
dd12	-1+x,-1+y,z	-4.5	4.0	non-specific
dd13	1+x,-1/2-y,-1/2+z	-2.6	2.4	non-specific
dd14	1+x,1/2-y,-1/2+z	-2.6	2.4	non-specific
dd15	-1+x,-1/2-y,1/2+z	-2.6	2.4	non-specific
dd16	-1+x,1/2-y,1/2+z	-2.6	2.4	non-specific
dd17	1+x,2+y,z	-2.1	1.9	H…H, 2.34 Å
dd18	-1+x,-2+y,z	-2.1	1.9	H…H, 2.34 Å

Table S16. Symmetry codes, binding types, interaction energies of the **dimeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **0.88 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
dd1	x,-1+y,z	-11.3	10.1	non-specific
dd2	x,1+y,z	-11.3	10.1	non-specific
dd3	x,-1/2-y,-1/2+z	-9.2	8.2	C-H…π, 2.68 Å, 164°; C…H, 2.88 Å
dd4	x,-1/2-y,1/2+z	-9.2	8.2	C-H…π, 2.68 Å, 164°; C…H, 2.88 Å
dd5	x,1/2-y,-1/2+z	-9.2	8.2	C-H…π, 2.68 Å, 164°; C…H, 2.88 Å
dd6	x,1/2-y,1/2+z	-9.2	8.2	C-H…π, 2.68 Å, 164°; C…H, 2.88 Å
dd7	x,-3/2-y,-1/2+z	-7.2	6.4	C…H, 2.85 Å
dd8	x,-3/2-y,1/2+z	-7.2	6.4	C…H, 2.85 Å
dd9	x,3/2-y,-1/2+z	-7.2	6.4	C…H, 2.85 Å
dd10	x,3/2-y,1/2+z	-7.2	6.4	C…H, 2.85 Å
dd11	-1+x,-1+y,z	-4.5	4.0	non-specific
dd12	1+x,1+y,z	-4.5	4.0	non-specific
dd13	-1+x,-1/2-y,1/2+z	-2.6	2.3	non-specific
dd14	-1+x,1/2-y,1/2+z	-2.6	2.3	non-specific
dd15	1+x,-1/2-y,-1/2+z	-2.6	2.3	non-specific
dd16	1+x,1/2-y,-1/2+z	-2.6	2.3	non-specific
dd17	-1+x,-2+y,z	-2.2	1.9	non-specific
dd18	1+x,2+y,z	-2.2	1.9	non-specific

Table S17. Symmetry codes, binding types, interaction energies of the **dimeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **1.70 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
dd1	x,-1+y,z	-11.3	9.9	non-specific
dd2	x,1+y,z	-11.3	9.9	non-specific
dd3	x,-1/2-y,-1/2+z	-9.2	8.0	C-H…π, 2.63 Å, 163°; C…H, 2.80 Å
dd4	x,-1/2-y,1/2+z	-9.2	8.0	C-H…π, 2.63 Å, 163°; C…H, 2.80 Å
dd5	x,1/2-y,-1/2+z	-9.2	8.0	C-H…π, 2.63 Å, 163°; C…H, 2.80 Å
dd6	x,1/2-y,1/2+z	-9.2	8.0	C-H…π, 2.63 Å, 163°; C…H, 2.80 Å
dd7	x,-3/2-y,-1/2+z	-7.6	6.6	C…H, 2.72 Å
dd8	x,-3/2-y,1/2+z	-7.6	6.6	C…H, 2.72 Å
dd9	x,3/2-y,-1/2+z	-7.6	6.6	C…H, 2.72 Å
dd10	x,3/2-y,1/2+z	-7.6	6.6	C…H, 2.72 Å
dd11	-1+x,-1+y,z	-4.8	4.2	non-specific
dd12	1+x,1+y,z	-4.8	4.2	non-specific
dd13	-1+x,-1/2-y,1/2+z	-2.7	2.3	H…H, 2.21 Å
dd14	-1+x,1/2-y,1/2+z	-2.7	2.3	H…H, 2.21 Å
dd15	1+x,-1/2-y,-1/2+z	-2.7	2.3	H…H, 2.21 Å
dd16	1+x,1/2-y,-1/2+z	-2.7	2.3	H…H, 2.21 Å
dd17	-1+x,-2+y,z	-2.3	2.0	H…H, 2.28 Å
dd18	1+x,2+y,z	-2.3	2.0	H…H, 2.28 Å

Table S18. Symmetry codes, binding types, interaction energies of the **dimeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **1.89 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
dd1	x,-1+y,z	-11.2	9.8	O-H…O, 2.43 Å, 125°
dd2	x,1+y,z	-11.2	9.8	O-H…O, 2.43 Å, 125°
dd3	x,-1/2-y,1/2+z	-9.1	8.0	C-H…π, 2.55 Å, 164°; C…H, 2.81 Å
dd4	x,1/2-y,-1/2+z	-9.1	8.0	C-H…π, 2.55 Å, 164°; C…H, 2.81 Å
dd5	x,1/2-y,1/2+z	-9.1	8.0	C-H…π, 2.55 Å, 164°; C…H, 2.81 Å
dd6	x,-1/2-y,-1/2+z	-9.1	8.0	C-H…π, 2.55 Å, 164°; C…H, 2.81 Å
dd7	x,3/2-y,-1/2+z	-7.6	6.6	C…H, 2.70 Å
dd8	x,3/2-y,1/2+z	-7.6	6.6	C…H, 2.70 Å
dd9	x,-3/2-y,-1/2+z	-7.6	6.6	C…H, 2.70 Å
dd10	x,-3/2-y,1/2+z	-7.6	6.6	C…H, 2.70 Å
dd11	1+x,1+y,z	-4.8	4.2	non-specific
dd12	-1+x,-1+y,z	-4.8	4.2	non-specific
dd13	1+x,-1/2-y,-1/2+z	-2.7	2.4	H…H, 2.23 Å
dd14	1+x,1/2-y,-1/2+z	-2.7	2.4	H…H, 2.23 Å
dd15	-1+x,-1/2-y,1/2+z	-2.7	2.4	H…H, 2.23 Å
dd16	-1+x,1/2-y,1/2+z	-2.7	2.4	H…H, 2.23 Å
dd17	1+x,2+y,z	-2.3	2.0	H…H, 2.22 Å
dd18	-1+x,-2+y,z	-2.3	2.0	H…H, 2.22 Å

Table S19. Symmetry codes, binding types, interaction energies of the **dimeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **2.32 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
dd1	x,-1+y,z	-11.2	9.9	O-H…O, 2.43 Å, 124°
dd2	x,1+y,z	-11.2	9.9	O-H…O, 2.43 Å, 124°
dd3	x,-1/2-y,1/2+z	-8.6	7.7	C-H…π, 2.48 Å, 164°; C…H, 2.73 Å
dd4	x,1/2-y,1/2+z	-8.6	7.7	C-H…π, 2.48 Å, 164°; C…H, 2.73 Å
dd5	x,1/2-y,-1/2+z	-8.6	7.7	C-H…π, 2.48 Å, 164°; C…H, 2.73 Å
dd6	x,-1/2-y,-1/2+z	-8.6	7.7	C-H…π, 2.48 Å, 164°; C…H, 2.73 Å
dd7	x,3/2-y,-1/2+z	-7.6	6.8	C…H, 2.70 Å, 2.88 Å; H…H, 2.33 Å
dd8	x,3/2-y,1/2+z	-7.6	6.8	C…H, 2.70 Å, 2.88 Å; H…H, 2.33 Å
dd9	x,-3/2-y,-1/2+z	-7.6	6.8	C…H, 2.70 Å, 2.88 Å; H…H, 2.33 Å
dd10	x,-3/2-y,1/2+z	-7.6	6.8	C…H, 2.70 Å, 2.88 Å; H…H, 2.33 Å
dd11	1+x,1+y,z	-4.9	4.3	non-specific
dd12	-1+x,-1+y,z	-4.9	4.3	non-specific
dd13	1+x,-1/2-y,-1/2+z	-2.7	2.4	H…H, 2.19 Å
dd14	1+x,1/2-y,-1/2+z	-2.7	2.4	H…H, 2.19 Å
dd15	-1+x,-1/2-y,1/2+z	-2.7	2.4	H…H, 2.19 Å
dd16	-1+x,1/2-y,1/2+z	-2.7	2.4	H…H, 2.19 Å
dd17	1+x,2+y,z	-2.4	2.1	H…H, 2.22 Å
dd18	-1+x,-2+y,z	-2.4	2.1	H…H, 2.22 Å

Table S20. Symmetry codes, binding types, interaction energies of the **dimeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **2.65 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
dd1	x,-1+y,z	-11.0	9.8	O-H…O, 2.41 Å, 124°
dd2	x,1+y,z	-11.0	9.8	O-H…O, 2.41 Å, 124°
dd3	x,-1/2-y,-1/2+z	-8.7	7.7	C-H…π, 2.54 Å, 162°; C…H, 2.73 Å; C…C, 3.41 Å
dd4	x,-1/2-y,1/2+z	-8.7	7.7	C-H…π, 2.54 Å, 162°; C…H, 2.73 Å; C…C, 3.41 Å
dd5	x,1/2-y,-1/2+z	-8.7	7.7	C-H…π, 2.54 Å, 162°; C…H, 2.73 Å; C…C, 3.41 Å
dd6	x,1/2-y,1/2+z	-8.7	7.7	C-H…π, 2.54 Å, 162°; C…H, 2.73 Å; C…C, 3.41 Å
dd7	x,-3/2-y,-1/2+z	-7.6	6.7	C…H, 2.60 Å, 2.83 Å; H…H, 2.32 Å
dd8	x,-3/2-y,1/2+z	-7.6	6.7	C…H, 2.60 Å, 2.83 Å; H…H, 2.32 Å
dd9	x,3/2-y,-1/2+z	-7.6	6.7	C…H, 2.60 Å, 2.83 Å; H…H, 2.32 Å
dd10	x,3/2-y,1/2+z	-7.6	6.7	C…H, 2.60 Å, 2.83 Å; H…H, 2.32 Å
dd11	-1+x,-1+y,z	-4.9	4.4	non-specific
dd12	1+x,1+y,z	-4.9	4.4	non-specific
dd13	-1+x,-1/2-y,1/2+z	-2.7	2.4	H…H, 2.16 Å, 2.34 Å
dd14	-1+x,1/2-y,1/2+z	-2.7	2.4	H…H, 2.16 Å, 2.34 Å
dd15	1+x,-1/2-y,-1/2+z	-2.7	2.4	H…H, 2.16 Å, 2.34 Å
dd16	1+x,1/2-y,-1/2+z	-2.7	2.4	H…H, 2.16 Å, 2.34 Å
dd17	-1+x,-2+y,z	-2.4	2.1	H…H, 2.22 Å
dd18	1+x,2+y,z	-2.4	2.1	H…H, 2.22 Å

Table S21. Symmetry codes, binding types, interaction energies of the **dimeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **3.46 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
dd1	x,-1+y,z	-10.8	10.0	O-H…O, 2.41 Å, 123°; C…C, 3.40 Å
dd2	x,1+y,z	-10.8	10.0	O-H…O, 2.41 Å, 123°; C…C, 3.40 Å
dd3	x,-1/2-y,-1/2+z	-7.9	7.3	C-H…π, 2.43 Å, 163°; C…H, 2.63 Å; C…C, 3.31 Å, 3.39 Å
dd4	x,-1/2-y,1/2+z	-7.9	7.3	C-H…π, 2.43 Å, 163°; C…H, 2.63 Å; C…C, 3.31 Å, 3.39 Å
dd5	x,1/2-y,-1/2+z	-7.9	7.3	C-H…π, 2.43 Å, 163°; C…H, 2.63 Å; C…C, 3.31 Å, 3.39 Å
dd6	x,1/2-y,1/2+z	-7.9	7.3	C-H…π, 2.43 Å, 163°; C…H, 2.63 Å; C…C, 3.31 Å, 3.39 Å
dd7	x,-3/2-y,-1/2+z	-7.5	7.0	C…H, 2.53 Å, 2.75 Å, 2.85 Å; H…H, 2.27 Å, 2.32 Å
dd8	x,-3/2-y,1/2+z	-7.5	7.0	C…H, 2.53 Å, 2.75 Å, 2.85 Å; H…H, 2.27 Å, 2.32 Å
dd9	x,3/2-y,-1/2+z	-7.5	7.0	C…H, 2.53 Å, 2.75 Å, 2.85 Å; H…H, 2.27 Å, 2.32 Å
dd10	x,3/2-y,1/2+z	-7.5	7.0	C…H, 2.53 Å, 2.75 Å, 2.85 Å; H…H, 2.27 Å, 2.32 Å
dd11	-1+x,-1+y,z	-5.0	4.6	non-specific
dd12	1+x,1+y,z	-5.0	4.6	non-specific
dd13	-1+x,-1/2-y,1/2+z	-2.5	2.3	H…H, 2.10 Å, 2.31 Å; C…H, 2.85 Å, 2.88 Å
dd14	-1+x,1/2-y,1/2+z	-2.5	2.3	H…H, 2.10 Å, 2.31 Å; C…H, 2.85 Å, 2.88 Å
dd15	1+x,-1/2-y,-1/2+z	-2.5	2.3	H…H, 2.10 Å, 2.31 Å; C…H, 2.85 Å, 2.88 Å
dd16	1+x,1/2-y,-1/2+z	-2.5	2.3	H…H, 2.10 Å, 2.31 Å; C…H, 2.85 Å, 2.88 Å
dd17	-1+x,-2+y,z	-2.4	2.2	H…H, 2.15 Å; C…H, 2.87 Å
dd18	1+x,2+y,z	-2.4	2.2	H…H, 2.15 Å; C…H, 2.87 Å

Table S22. Symmetry codes, binding types, interaction energies of the **dimeric** building unit with neighboring ones (E_{int}, kcal/mol) and the contribution of these energies to the total interaction energy (%) in the crystal of ibuprofen **form I** under pressure of **4.00 GPa**.

Dimer	Symmetry operation	E_{int}, kcal/mol	Contribution to the total interaction energy, %	Interaction
dd1	x,-1+y,z	-10.8	10.0	O-H…O, 2.39 Å, 124°; O-H…O, 2.41 Å, 122°; C…C, 3.33 Å; C…H, 2.86 Å
dd2	x,1+y,z	-10.8	10.0	O-H…O, 2.39 Å, 124°; O-H…O, 2.41 Å, 122°; C…C, 3.33 Å; C…H, 2.86 Å
dd3	x,-1/2-y,-1/2+z	-7.8	7.2	C-H…π, 2.40 Å, 163°; C…H, 2.61 Å; C…C, 3.31 Å, 3.34 Å
dd4	x,-1/2-y,1/2+z	-7.8	7.2	C-H…π, 2.40 Å, 163°; C…H, 2.61 Å; C…C, 3.31 Å, 3.34 Å
dd5	x,1/2-y,-1/2+z	-7.8	7.2	C-H…π, 2.40 Å, 163°; C…H, 2.61 Å; C…C, 3.31 Å, 3.34 Å
dd6	x,1/2-y,1/2+z	-7.8	7.2	C-H…π, 2.40 Å, 163°; C…H, 2.61 Å; C…C, 3.31 Å, 3.34 Å
dd7	x,-3/2-y,-1/2+z	-7.4	6.9	C…H, 2.50 Å, 2.76 Å, 2.85 Å, 2.86 Å; H…H, 2.25 Å, 2.25 Å
dd8	x,-3/2-y,1/2+z	-7.4	6.9	C…H, 2.50 Å, 2.76 Å, 2.85 Å, 2.86 Å; H…H, 2.25 Å, 2.25 Å
dd9	x,3/2-y,-1/2+z	-7.4	6.9	C…H, 2.50 Å, 2.76 Å, 2.85 Å, 2.86 Å; H…H, 2.25 Å, 2.25 Å
dd10	x,3/2-y,1/2+z	-7.4	6.9	C…H, 2.50 Å, 2.76 Å, 2.85 Å, 2.86 Å; H…H, 2.25 Å, 2.25 Å
dd11	-1+x,-1+y,z	-5.1	4.7	non-specific
dd12	1+x,1+y,z	-5.1	4.7	non-specific
dd13	-1+x,-1/2-y,1/2+z	-2.6	2.4	H…H, 2.11 Å, 2.29 Å; C…H, 2.84 Å
dd14	-1+x,1/2-y,1/2+z	-2.6	2.4	H…H, 2.11 Å, 2.29 Å; C…H, 2.84 Å
dd15	1+x,-1/2-y,-1/2+z	-2.6	2.4	H…H, 2.11 Å, 2.29 Å; C…H, 2.84 Å
dd16	1+x,1/2-y,-1/2+z	-2.6	2.4	H…H, 2.11 Å, 2.29 Å; C…H, 2.84 Å
dd17	-1+x,-2+y,z	-2.4	2.3	H…H, 2.13 Å; C…H, 2.84 Å
dd18	1+x,2+y,z	-2.4	2.3	H…H, 2.13 Å; C…H, 2.84 Å

Table S23. **Minimal interatomic distances** and **absolute deviation (AD)** of their determination for the different step sizes in comparison to the high-precision computation with a step size of 1/1000 of a translation occurring during the displacement of the **dimeric** building units in polymorph **I** of ibuprofen along **[001]** and **[010]** directions of layers parallel to the **(100)** plane.

Shift direction	Step size (Part of a translation)	Minimal interatomic distance ± AD, Å					
		Ambient pressure	0.23 GPa	0.60 GPa	0.80 GPa	0.88 GPa	1.70 GPa
[010] (100)	0.20	0.265 β ± 0.360	0.446 β ± 0.275	0.234 β ± 0.381	0.543 β ± 0.025	0.096 β ± 0.497	0.153 β ± 0.306
	0.10	0.082	0.038	0.074	0.025	0.107	0.054
	0.05	0.051	0.033	0.064	0.025	0.107	0.054
	0.04	0.008	0.004	0.005	0.017	0.003	0.000
	0.02	0.008	0.004	0.005	0.000	0.003	0.000
[001] (100)	0.20	1.548 ± 0.039	1.450 ± 0.009	1.286 ± 0.042	1.182 ± 0.082	1.189 ± 0.055	1.017 ± 0.106
	0.10	0.039	0.009	0.042	0.082	0.055	0.106
	0.05	0.011	0.009	0.014	0.002	0.009	0.001
	0.04	0.002	0.009	0.003	0.001	0.001	0.003
	0.02	0.002	0.009	0.003	0.001	0.001	0.003
Shift direction	Step size (Part of a translation)	Minimal interatomic distance (AD), Å					
		1.89 GPa	2.32 GPa	2.65 GPa	3.46 GPa	4.00 GPa	
[010] (100)	0.20	0.195 β ± 0.264	0.243 β ± 0.116	0.285 β ± 0.034	0.156 β ± 0.051	0.207 β ±	0.038
	0.10	0.044	0.024	0.016	0.051		0.038

	0.05		0.044		0.024		0.016		0.051		0.038
	0.04		0.000		0.003		0.004		0.051		0.038
	0.02		0.000		0.003		0.001		0.000		0.000
[001] (100)	0.20		0.103		0.132		0.157		0.206		0.195
	0.10		0.103		0.126		0.112		0.097		0.118
	0.05	0.966 ±	0.001	0.907 ±	0.000	0.863 ±	0.001	0.747 ±	0.007	0.697 ±	0.003
	0.04		0.002		0.006		0.012		0.025		0.019
	0.02		0.002		0.005		0.002		0.000		0.001

[β] Movements in the directions marked with red are improbable from the topological point of view because of the molecules overlapping during the translations.

Table S24. **Minimal differences between the interatomic distances** and **the corresponding sums of van der Waals radii (δ)** and **absolute deviation (AD)** of their determination for the different step sizes in comparison to the high-precision computation with a step size of 1/1000 of a translation occurring during the displacement of the **dimeric** building units in polymorph **I** of ibuprofen along **[001]** and **[010]** directions of layers parallel to the **(100)** plane.

Shift direction	Step size (Part of a translation)	δ ± AD, Å					
		Ambient pressure	0.23 GPa	0.60 GPa	0.80 GPa	0.88 GPa	1.70 GPa
[010] (100)	0.20	-2.107 [β] ± 0.169	-2.093 [β] ± 0.089	-2.200 [β] ± 0.158	-2.352 [β] ± 0.131	-2.300 [β] ± 0.193	-2.449 [β] ± 0.118
	0.10	0.000	0.000	0.000	0.000	0.000	0.000
	0.05	0.000	0.000	0.000	0.000	0.000	0.000
	0.04	0.010	0.009	0.010	0.011	0.011	0.012
	0.02	0.000	0.000	0.000	0.000	0.000	0.000
[001] (100)	0.20	-0.632 ± 0.039	-0.730 ± 0.009	-0.894 ± 0.042	-0.998 ± 0.082	-0.991 ± 0.055	-1.163 [γ] ± 0.109
	0.10	0.039	0.009	0.042	0.082	0.055	0.109
	0.05	0.011	0.009	0.014	0.002	0.009	0.000
	0.04	0.002	0.009	0.003	0.001	0.001	0.003
	0.02	0.002	0.001	0.003	0.001	0.001	0.003
Shift direction	Step size (Part of a translation)	δ ± AD, Å					
		1.89 GPa	2.32 GPa	2.65 GPa	3.46 GPa	4.00 GPa	
[010] (100)	0.20	-2.499 [β] ± 0.168	-2.522 [β] ± 0.090	-2.557 [β] ± 0.085	-2.634 [β] ± 0.051	-2.669 [β] ± 0.124	
	0.10	0.000	0.000	0.000	0.003	0.000	
	0.05	0.000	0.000	0.000	0.003	0.000	

	0.04		0.012		0.013		0.013		0.016		0.014
	0.02		0.000		0.000		0.000		0.000		0.000
[001] (100)	0.20	-1.214 ±	0.103	-1.273 ±	0.132	-1.317 ±	0.157	-1.433 ±	0.206	-1.483 ±	0.195
	0.10		0.103		0.126		0.112		0.097		0.118
	0.05		0.001		0.000		0.001		0.007		0.003
	0.04		0.002		0.006		0.012		0.025		0.019
	0.02		0.002		0.005		0.002		0.000		0.001

β Movements in the directions marked with red are improbable from the topological point of view because of the molecules overlapping during the translations.

γ Probability of movements in the directions marked with yellow are very low because of the compression of material / molecules rapprochement.

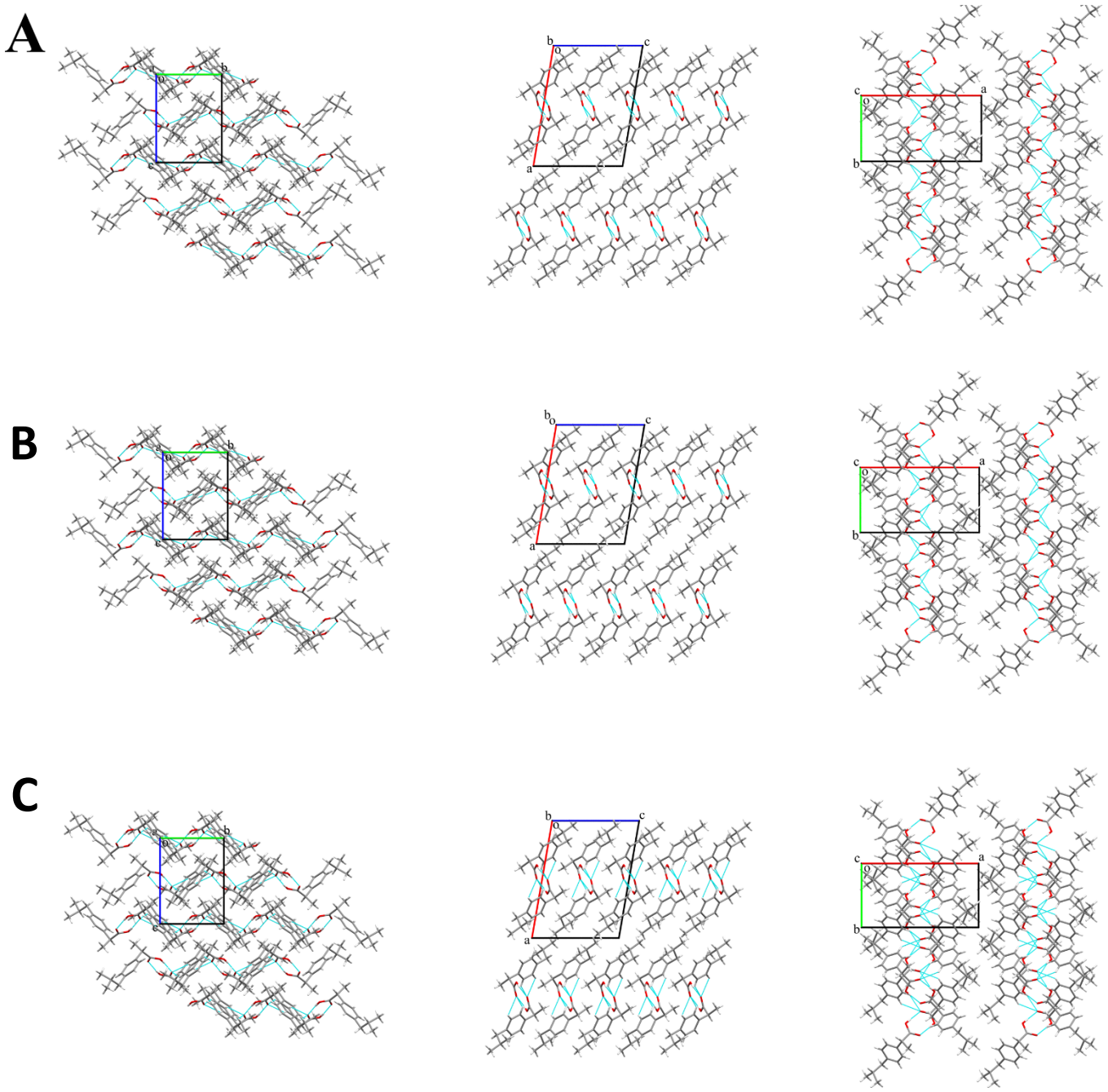

Figure S1. Packing of the molecules in the crystals of ibuprofen polymorphs **I at ambient pressure** and under the pressure of **0.23** and **0.60 GPa**. The projections in *a* (right), *b* (middle), *c* (left) crystallographic directions are represented

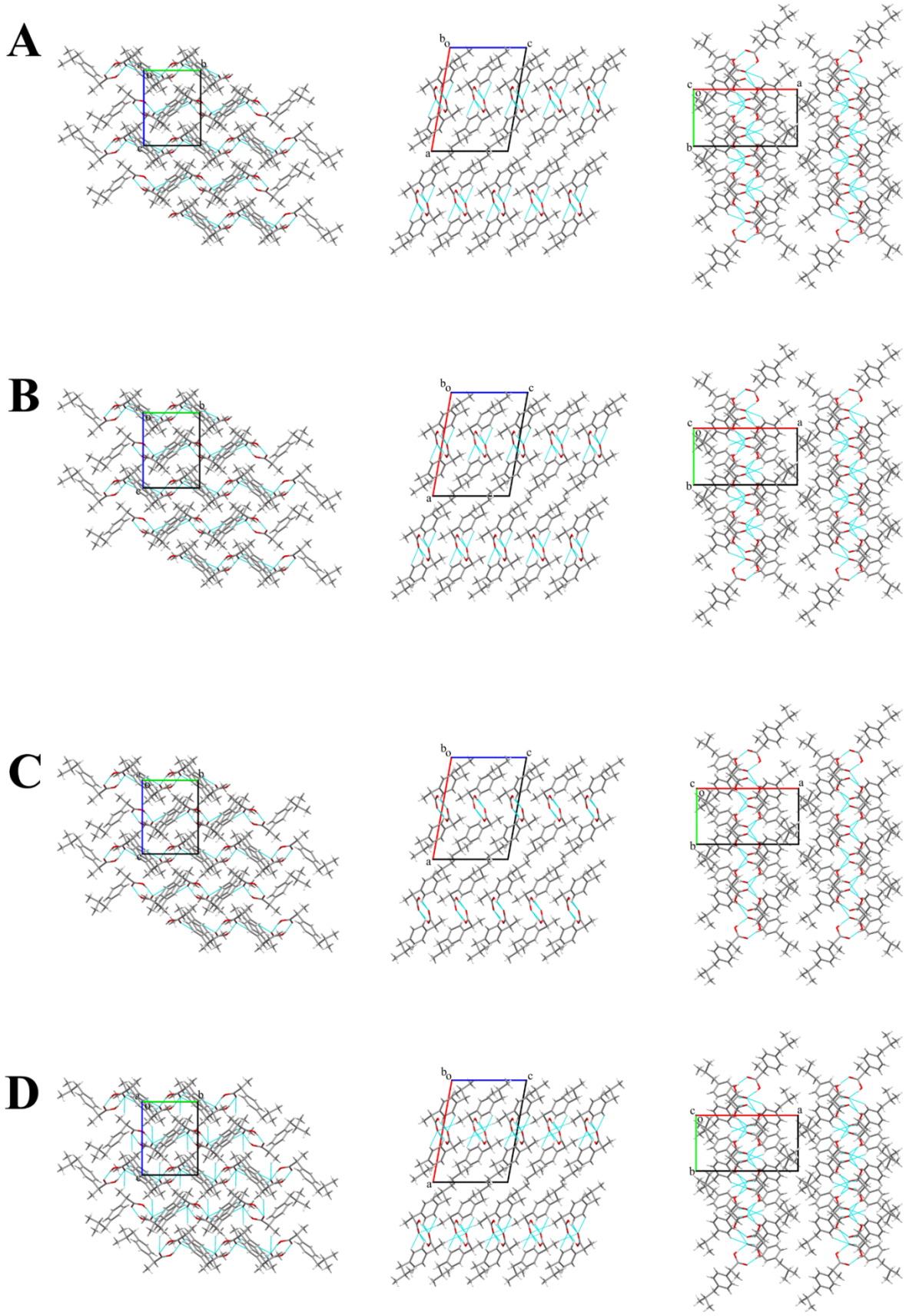

Figure S2. Packing of the molecules in the crystals of ibuprofen polymorph **I** under the pressure of **0.80 (A)**, **0.88 (B)**, **1.70 (C)** and **1.89 GPa (D)**. The projections in *a* (right), *b* (middle), *c* (left) crystallographic directions are represented.

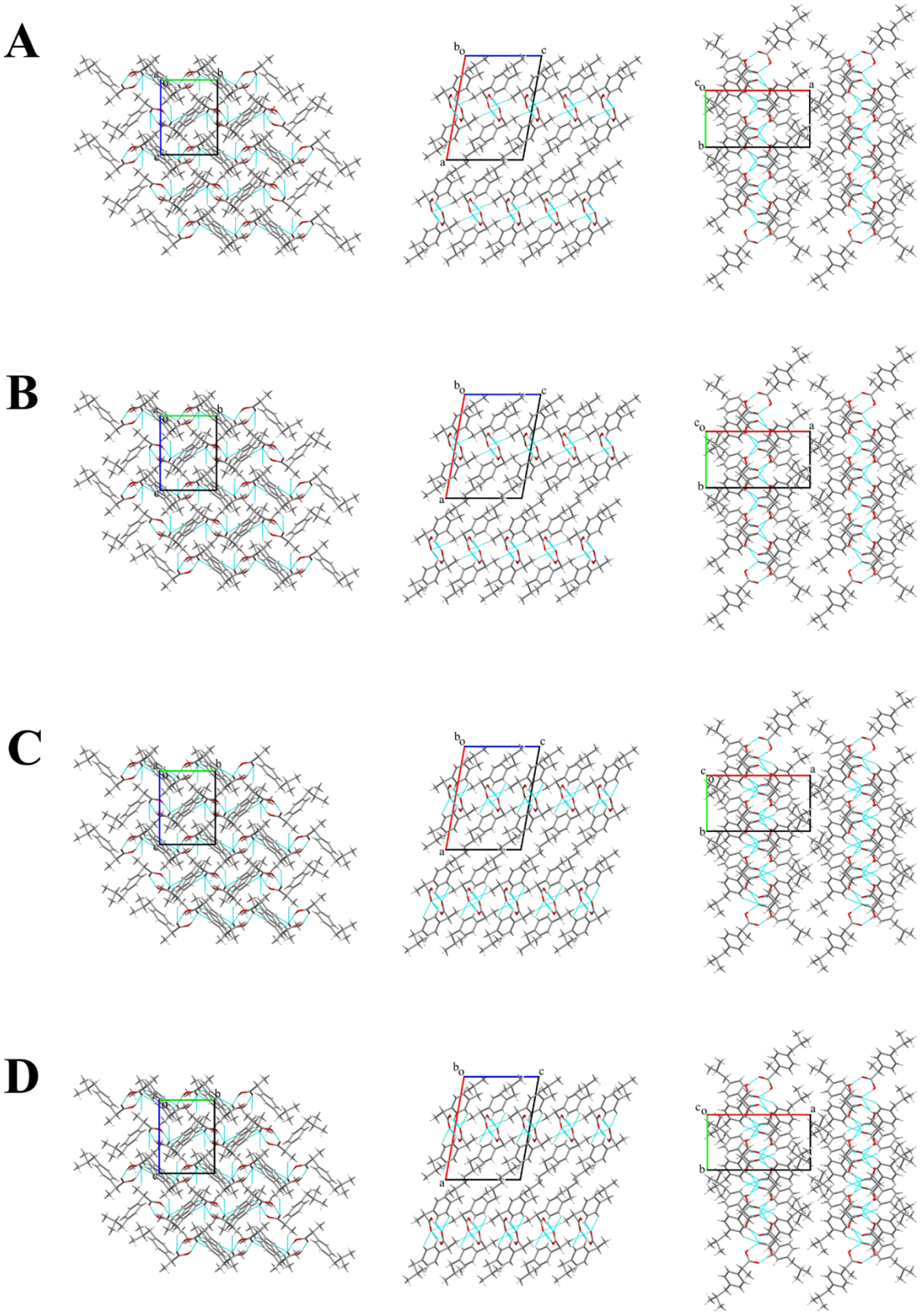

Figure S3. Packing of the molecules in the crystals of ibuprofen polymorph **I** under the pressure of **2.32 (A)**, **2.65 (B)**, **3.46 (C)** and **4.00 GPa (D)**. The projections in *a* (right), *b* (middle), *c* (left) crystallographic directions are represented.

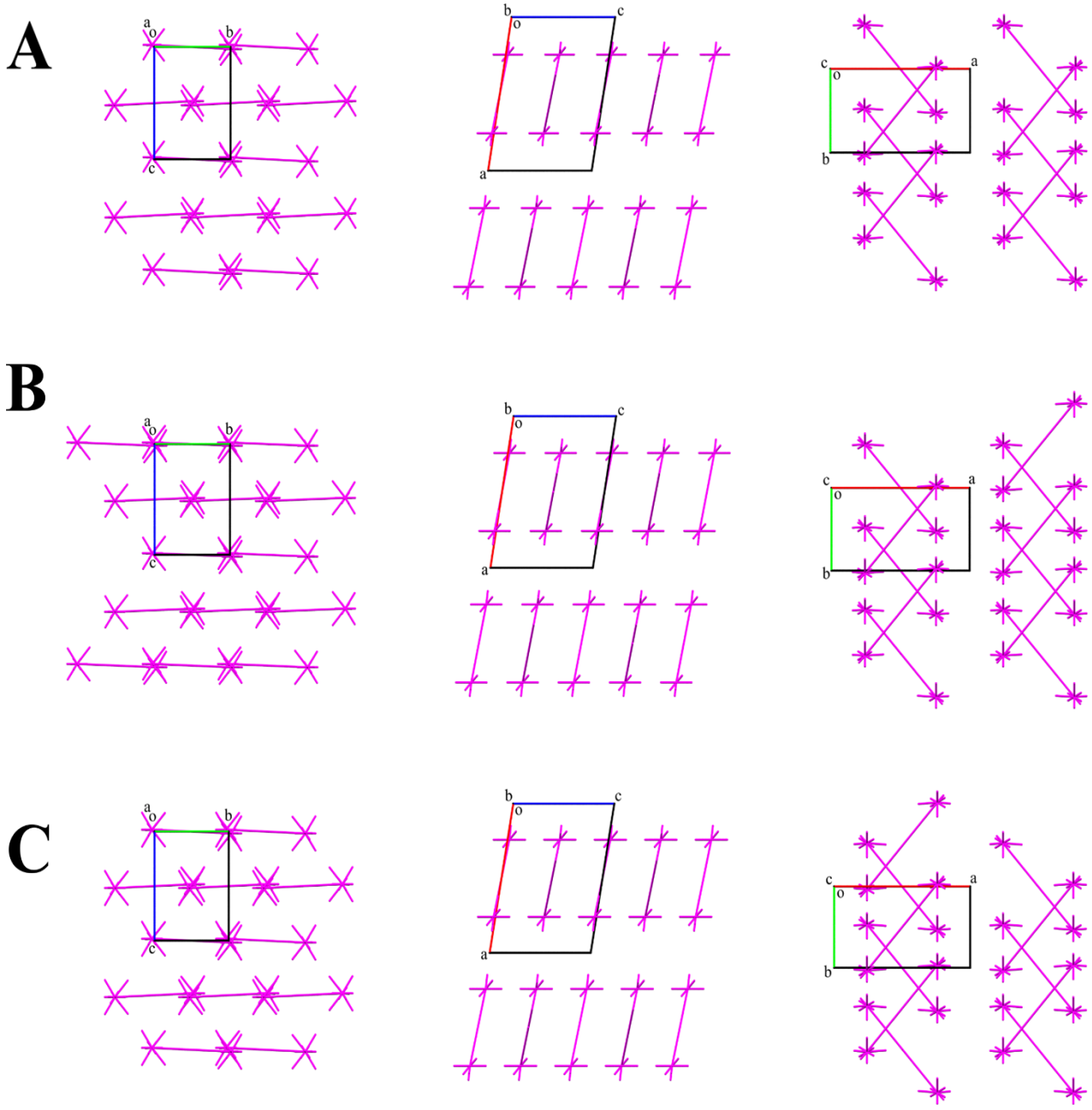

Figure S4. Packing of the energy vector diagrams representing the pairwise interaction energy distribution of **monomeric** building units in the crystals of ibuprofen polymorphs **I (A) at ambient pressure** and under the pressure of **0.23 (B)** and **0.60 GPa (C)**. The projections in *a* (right), *b* (middle), *c* (left) crystallographic directions are represented.

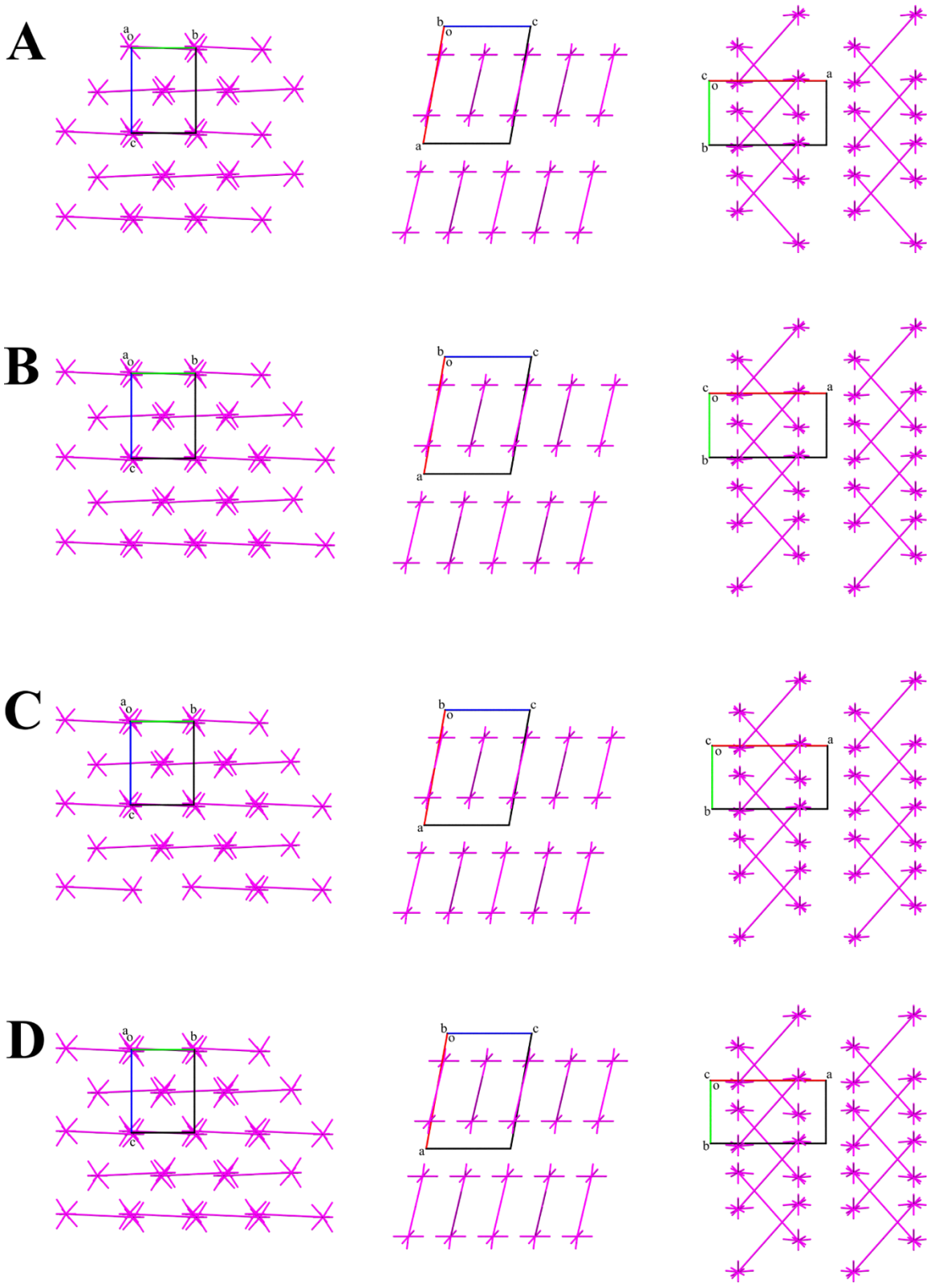

Figure S5. Packing of the energy vector diagrams representing the pairwise interaction energy distribution of **monomeric** building units in the crystals of ibuprofen polymorph **I** under the pressure of **0.80 (A)**, **0.88 (B)**, **1.70 (C)** and **1.89 GPa (D)**. The projections in *a* (right), *b* (middle), *c* (left) crystallographic directions are represented.

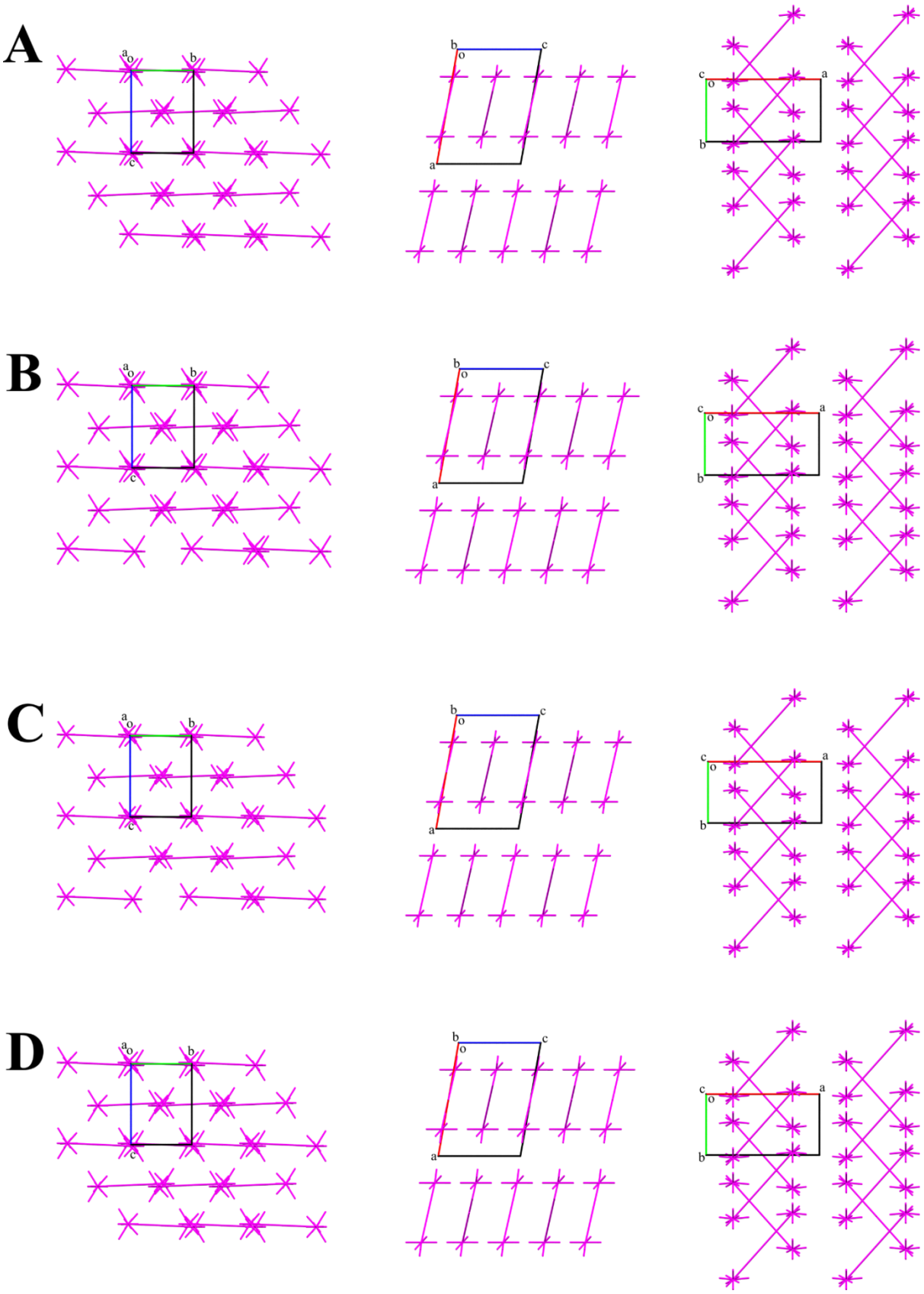

Figure S6. Packing of the energy vector diagrams representing the pairwise interaction energy distribution of **monomeric** building units in the crystals of ibuprofen polymorph **I** under the pressure of **2.32 (A)**, **2.65 (B)**, **3.46 (C)** and **4.00 GPa (D)**. The projections in *a* (right), *b* (middle), *c* (left) crystallographic directions are represented.

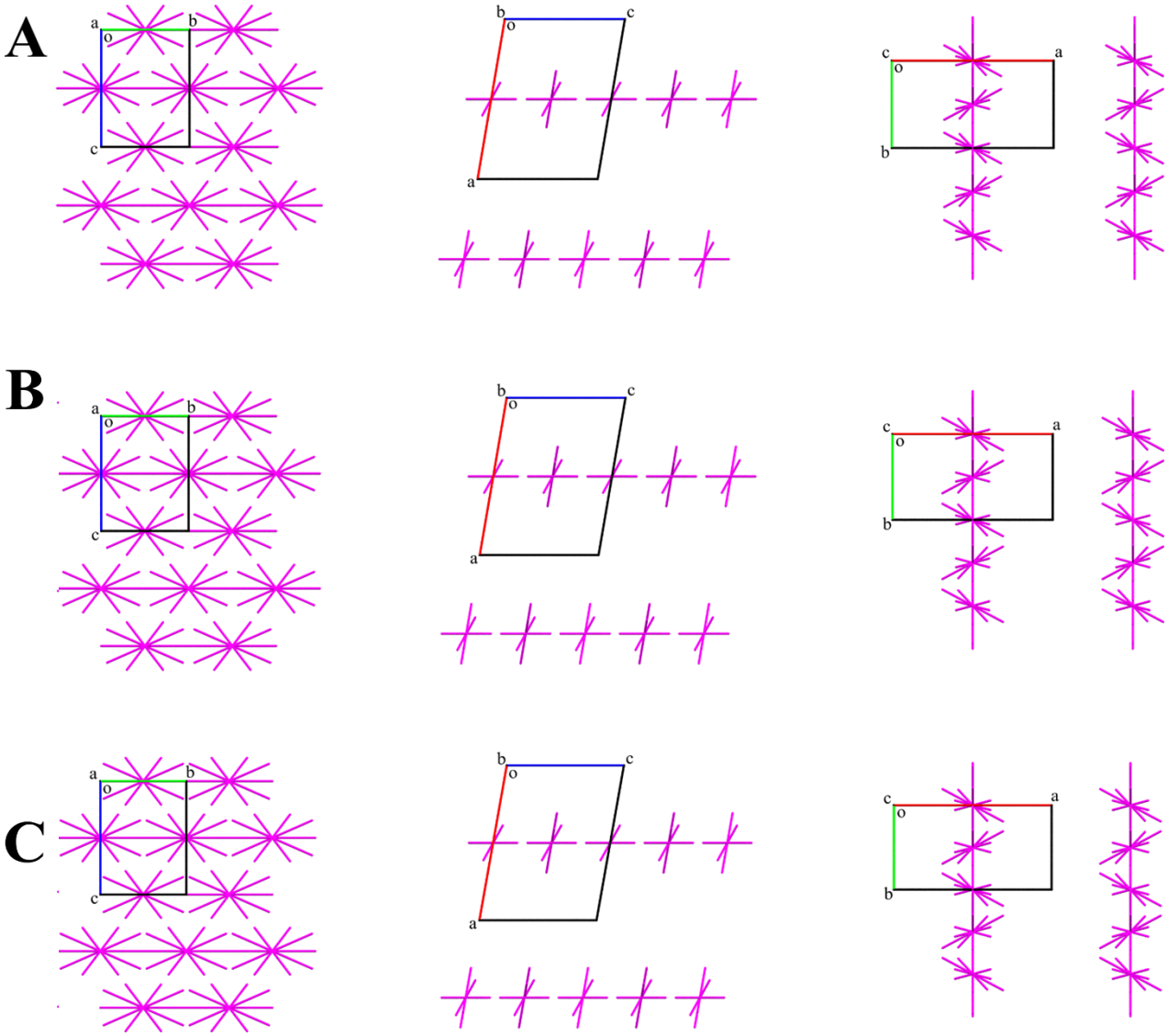

Figure S7. Packing of the energy vector diagrams representing the pairwise interaction energy distribution of **dimeric** building units in the crystals of ibuprofen polymorphs **I (A) at ambient pressure** and under the pressure of **0.23 (B)** and **0.60 GPa (B)**. The projections in *a* (right), *b* (middle), *c* (left) crystallographic directions are represented.

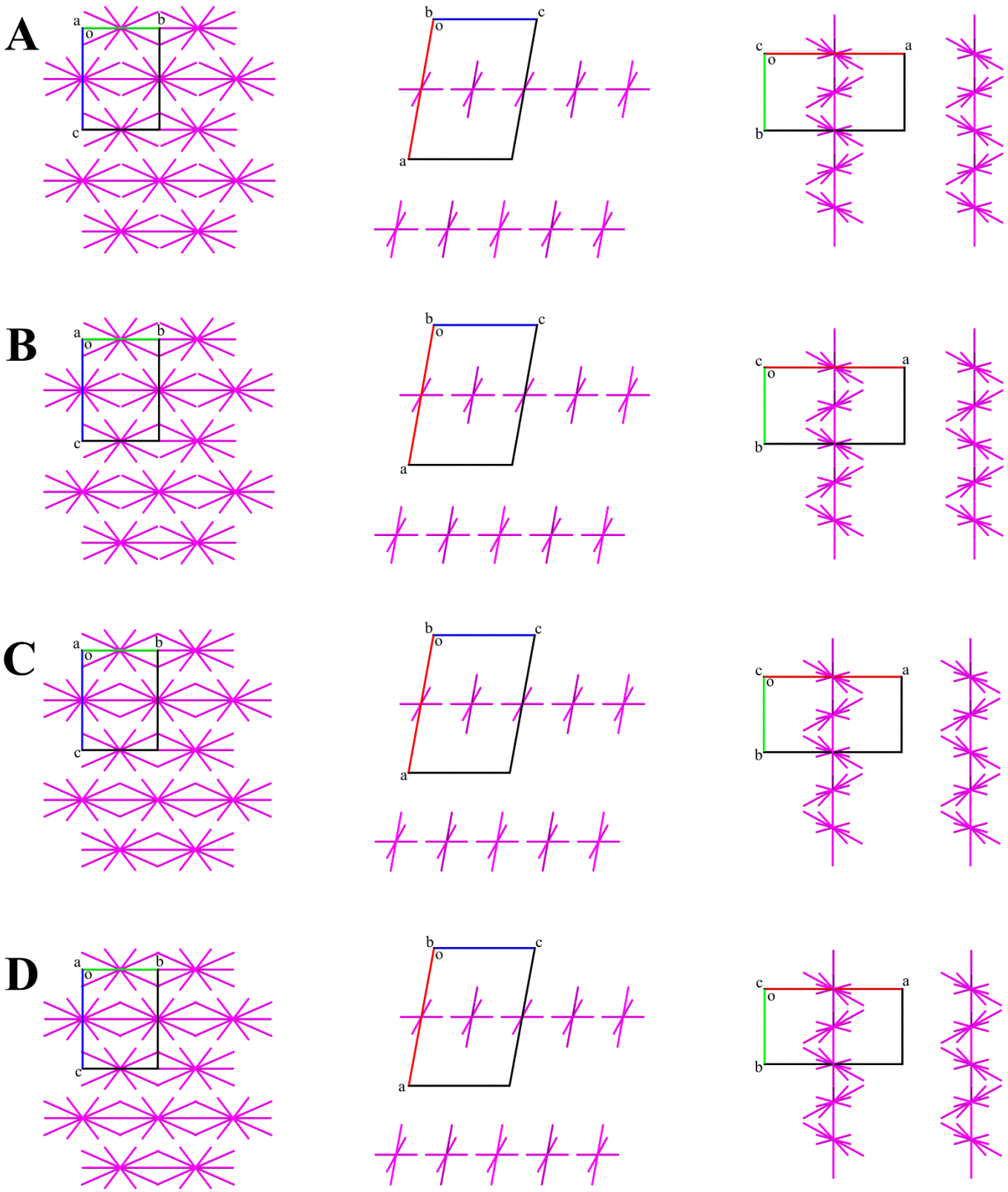

Figure S8. Packing of the energy vector diagrams representing the pairwise interaction energy distribution of **dimeric** building units in the crystals of ibuprofen polymorph **I** under the pressure of **0.80 (A)**, **0.88 (B)**, **1.70 (C)** and **1.89 GPa (D)**. The projections in *a* (right), *b* (middle), *c* (left) crystallographic directions are represented.

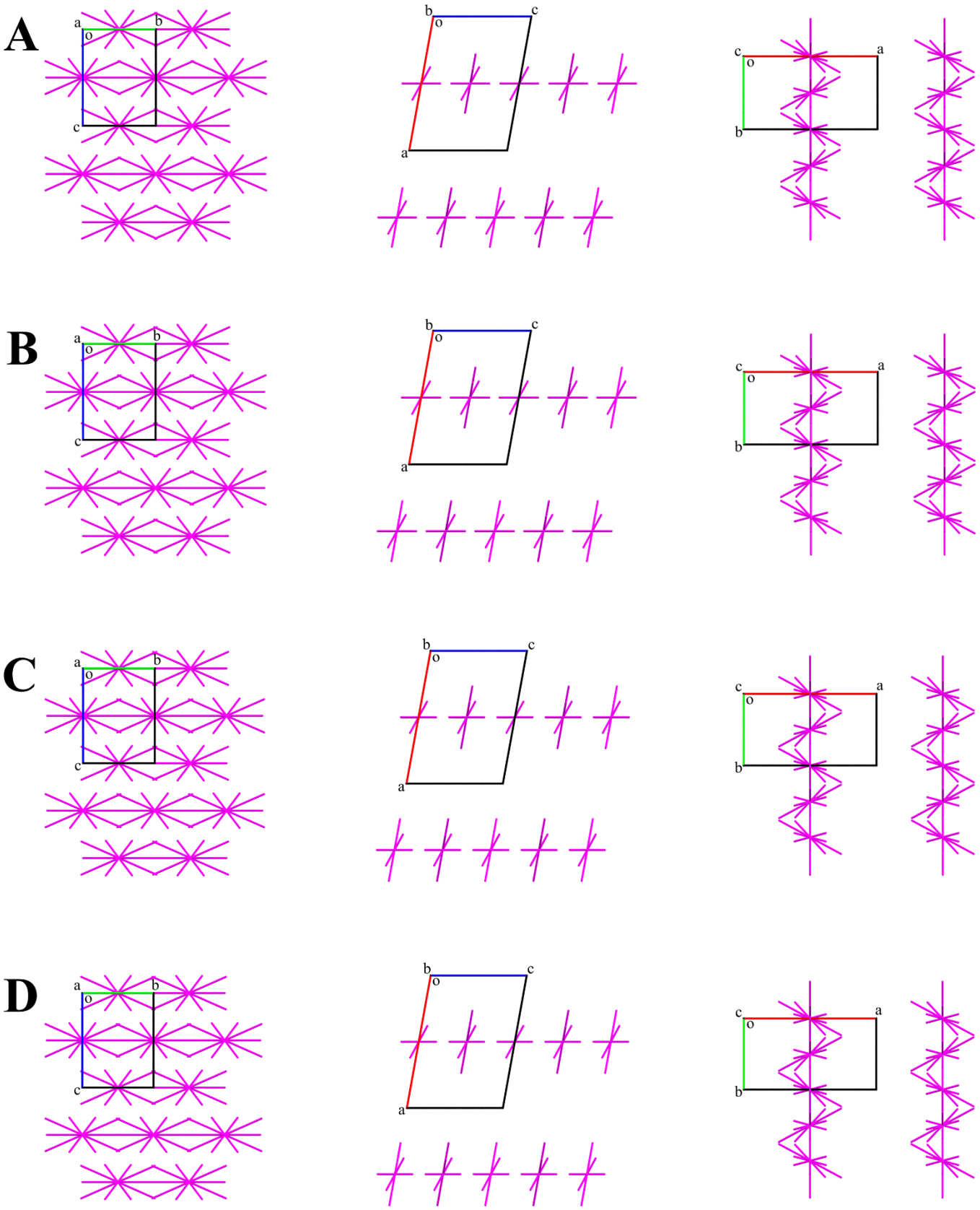

Figure S9. Packing of the energy vector diagrams representing the pairwise interaction energy distribution of **dimeric** building units in the crystals of ibuprofen polymorph **I** under the pressure of **2.32 (A)**, **2.65 (B)**, **3.46 (C)** and **4.00 GPa (D)**. The projections in *a* (right), *b* (middle), *c* (left) crystallographic directions are represented.

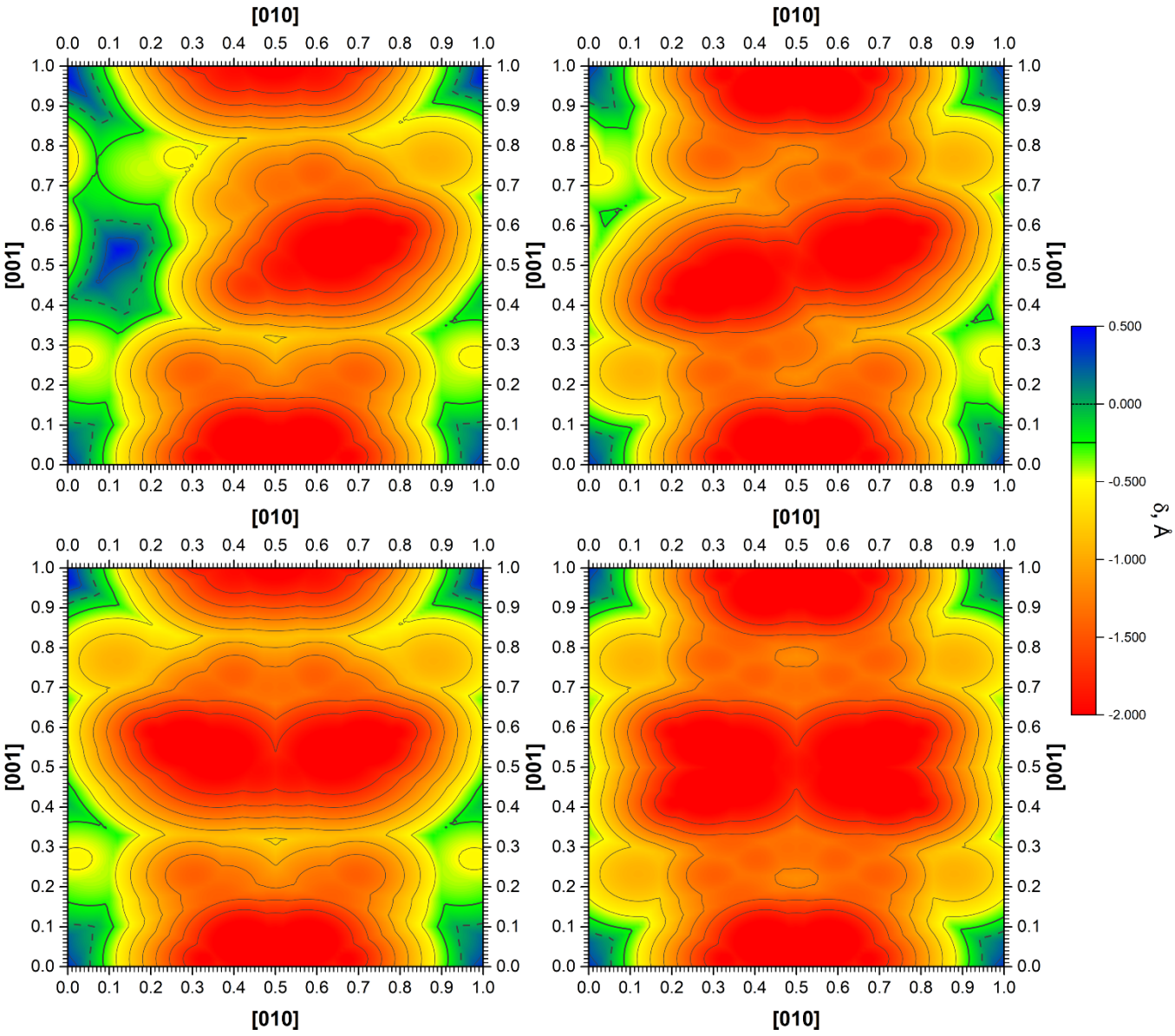

Figure S10. 2D-maps of the parameter δ during the displacement of the mobile DBU to the fixed part within the (100) crystallographic layer calculated using four model systems extracted from the crystal structure of the ibuprofen polymorphic form I at **ambient pressure**.

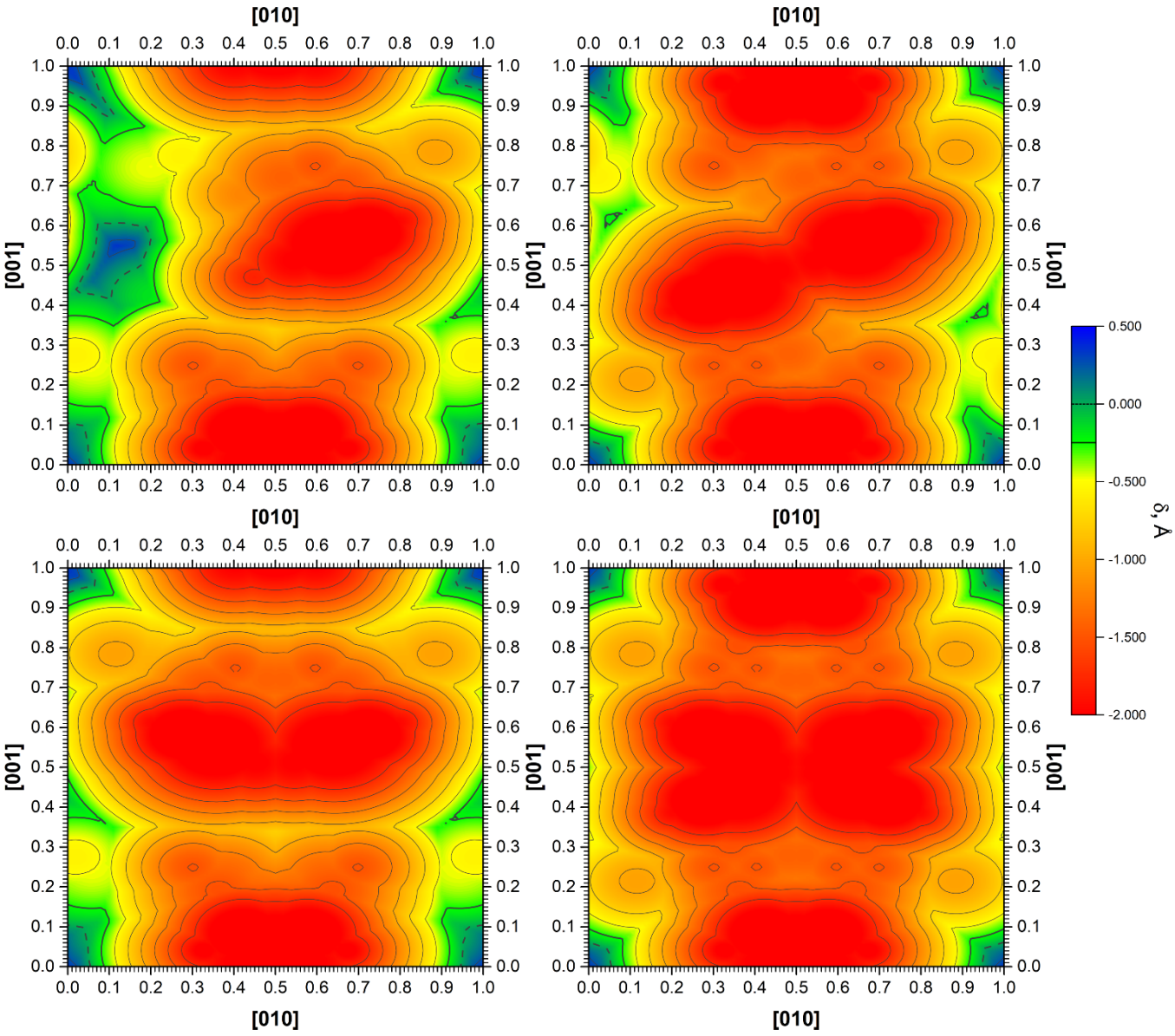

Figure S11. 2D-maps of the parameter δ during the displacement of the mobile DBU to the fixed part within the (100) crystallographic layer calculated using four model systems extracted from the crystal structure of the ibuprofen polymorphic form **I** under the pressure of **0.23 GPa**.

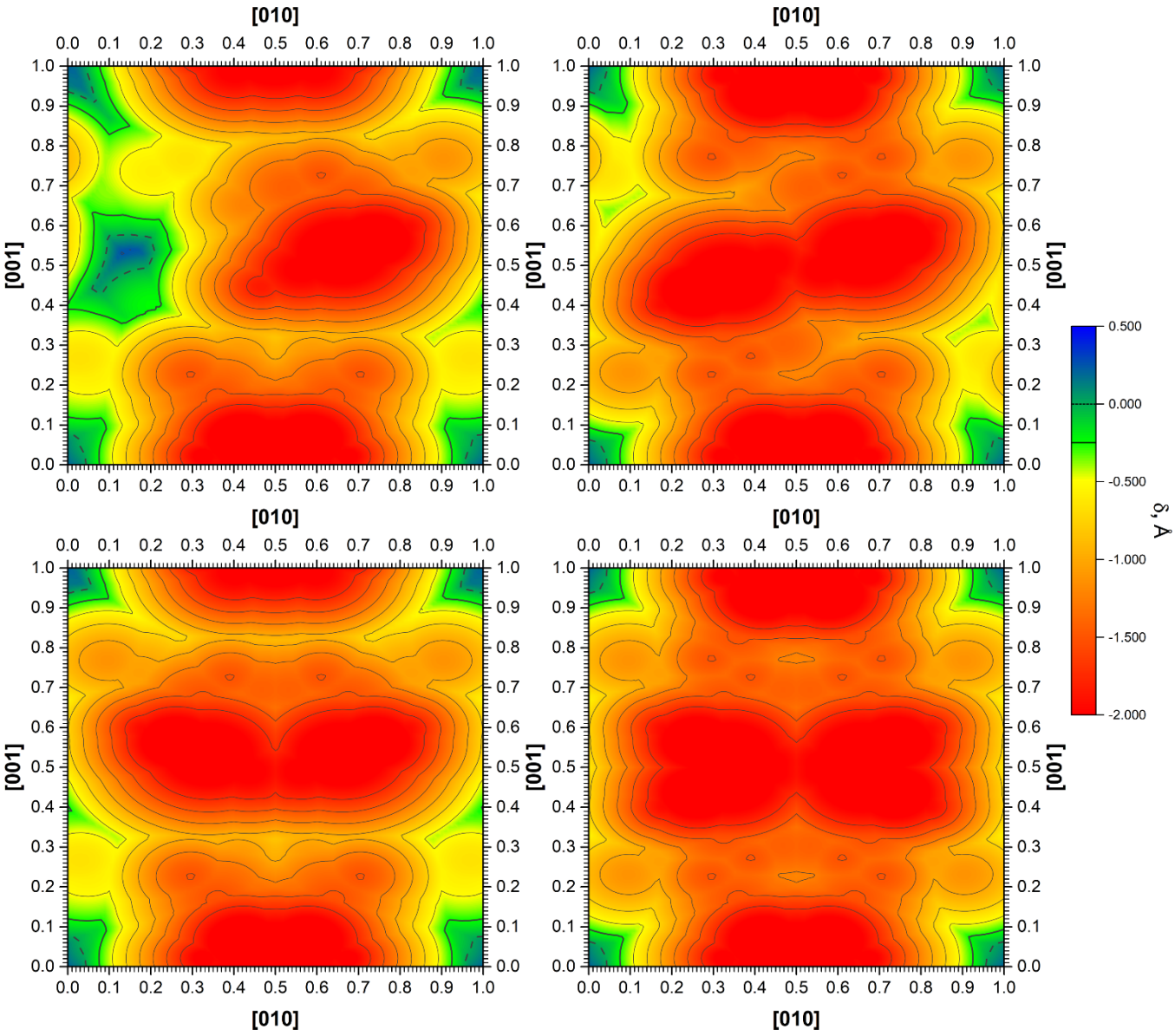

Figure S12. 2D-maps of the parameter δ during the displacement of the mobile DBU to the fixed part within the (100) crystallographic layer calculated using four model systems extracted from the crystal structure of the ibuprofen polymorphic form **I** under the pressure of **0.60 GPa**.

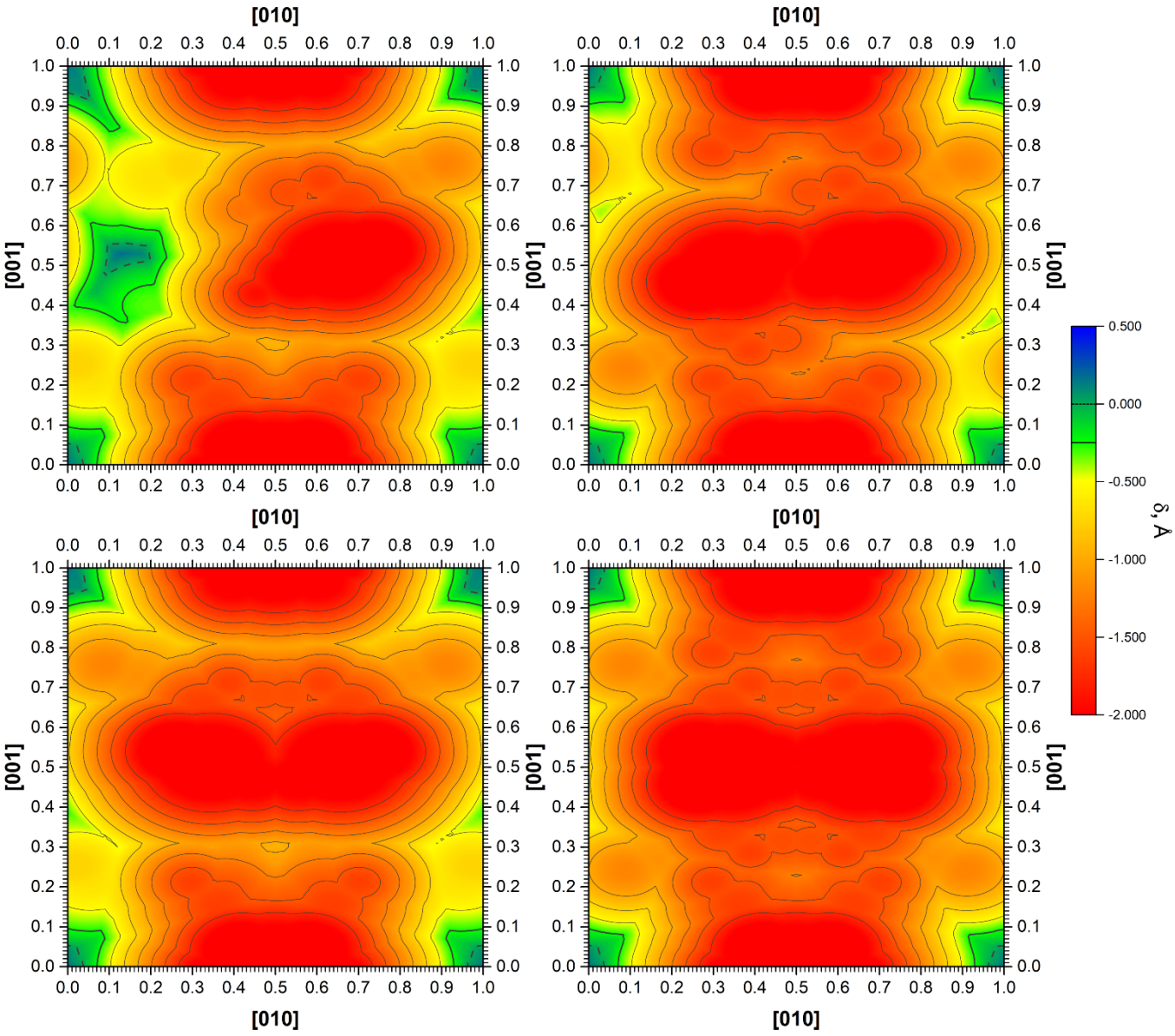

Figure S13. 2D-maps of the parameter δ during the displacement of the mobile DBU to the fixed part within the (100) crystallographic layer calculated using four model systems extracted from the crystal structure of the ibuprofen polymorphic form **I** under the pressure of **0.80 GPa**.

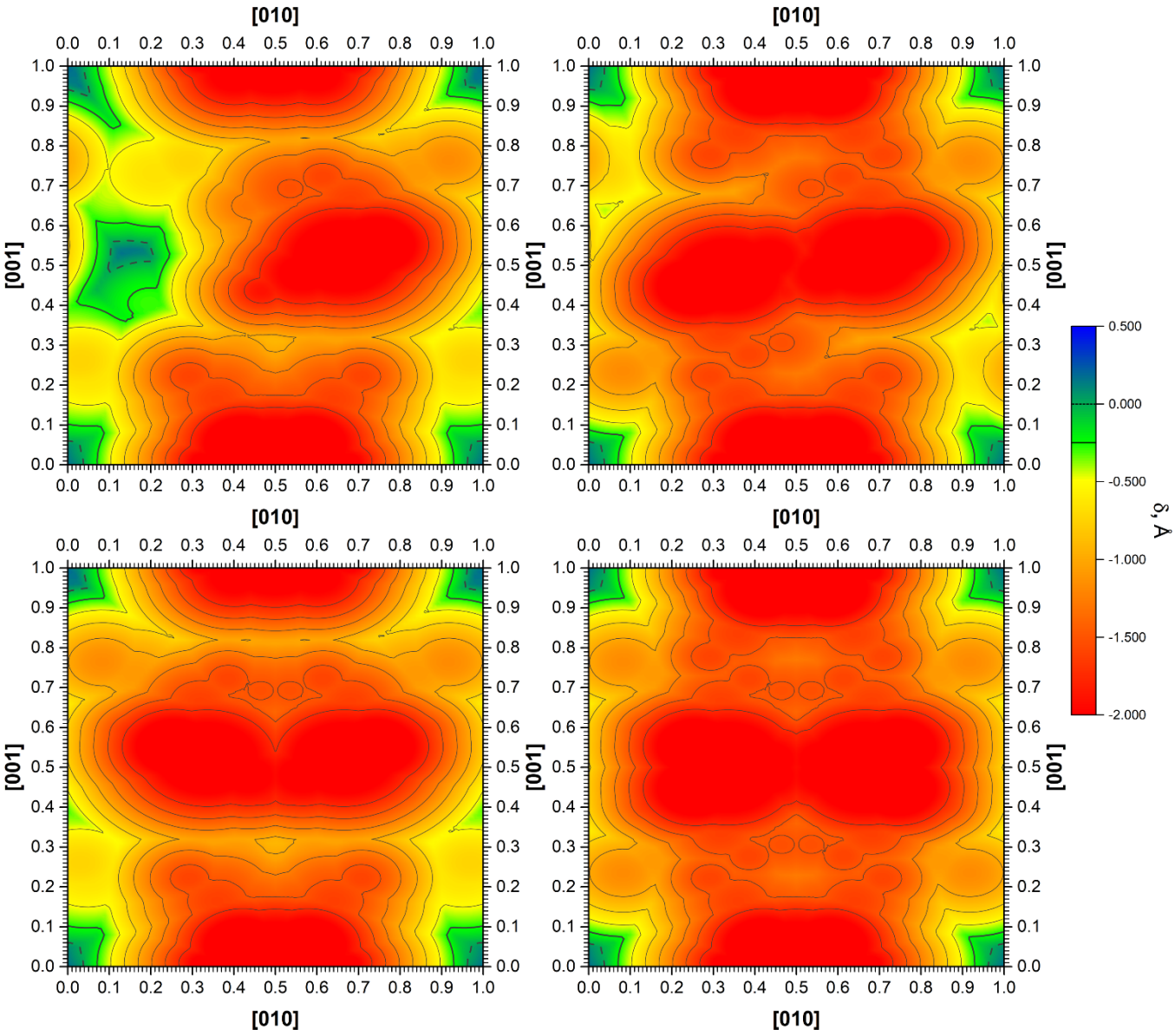

Figure S14. 2D-maps of the parameter δ during the displacement of the mobile DBU to the fixed part within the (100) crystallographic layer calculated using four model systems extracted from the crystal structure of the ibuprofen polymorphic form **I** under the pressure of **0.88 GPa**.

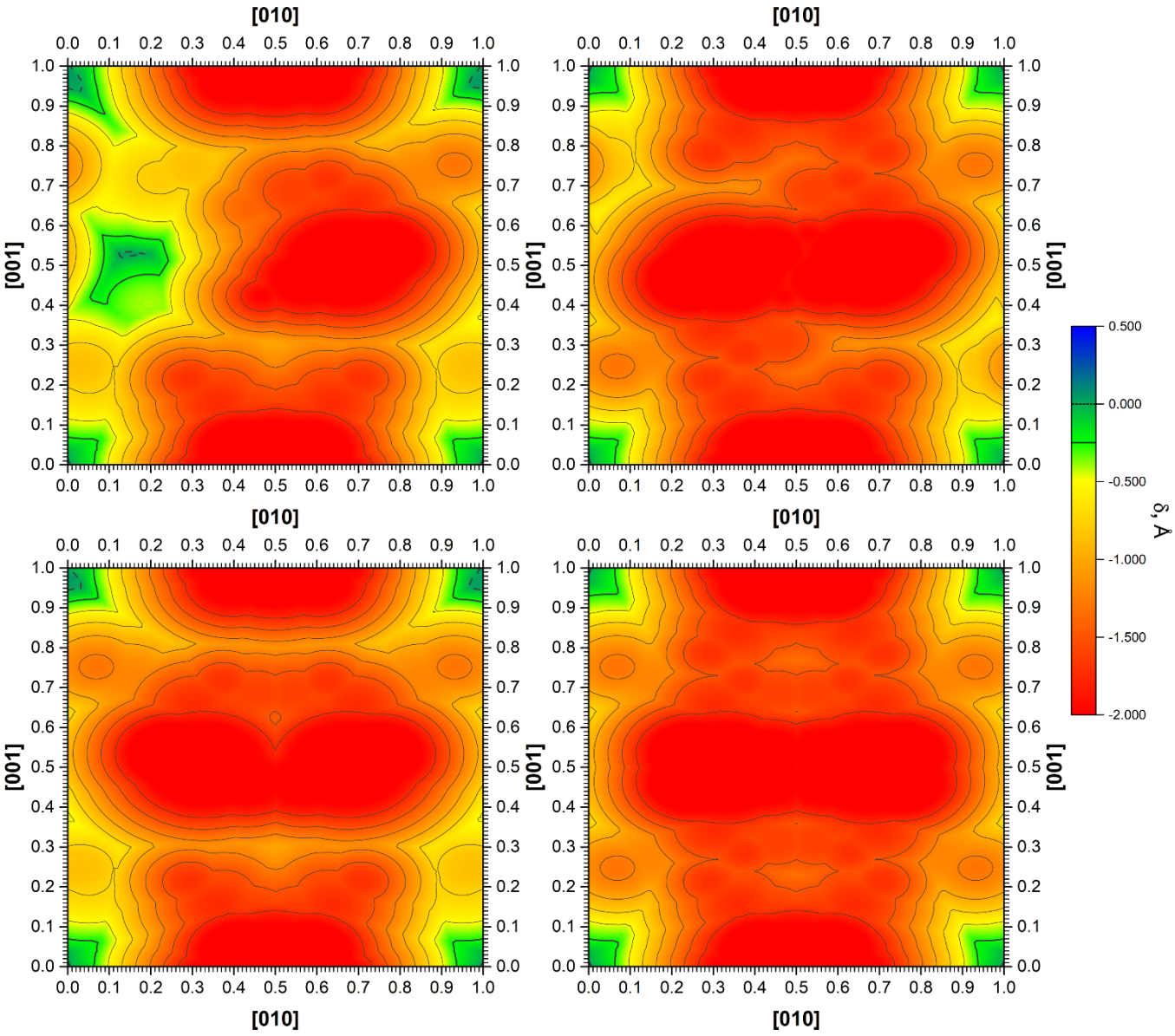

Figure S15. 2D-maps of the parameter δ during the displacement of the mobile DBU to the fixed part within the (100) crystallographic layer calculated using four model systems extracted from the crystal structure of the ibuprofen polymorphic form **I** under the pressure of **1.70 GPa**.

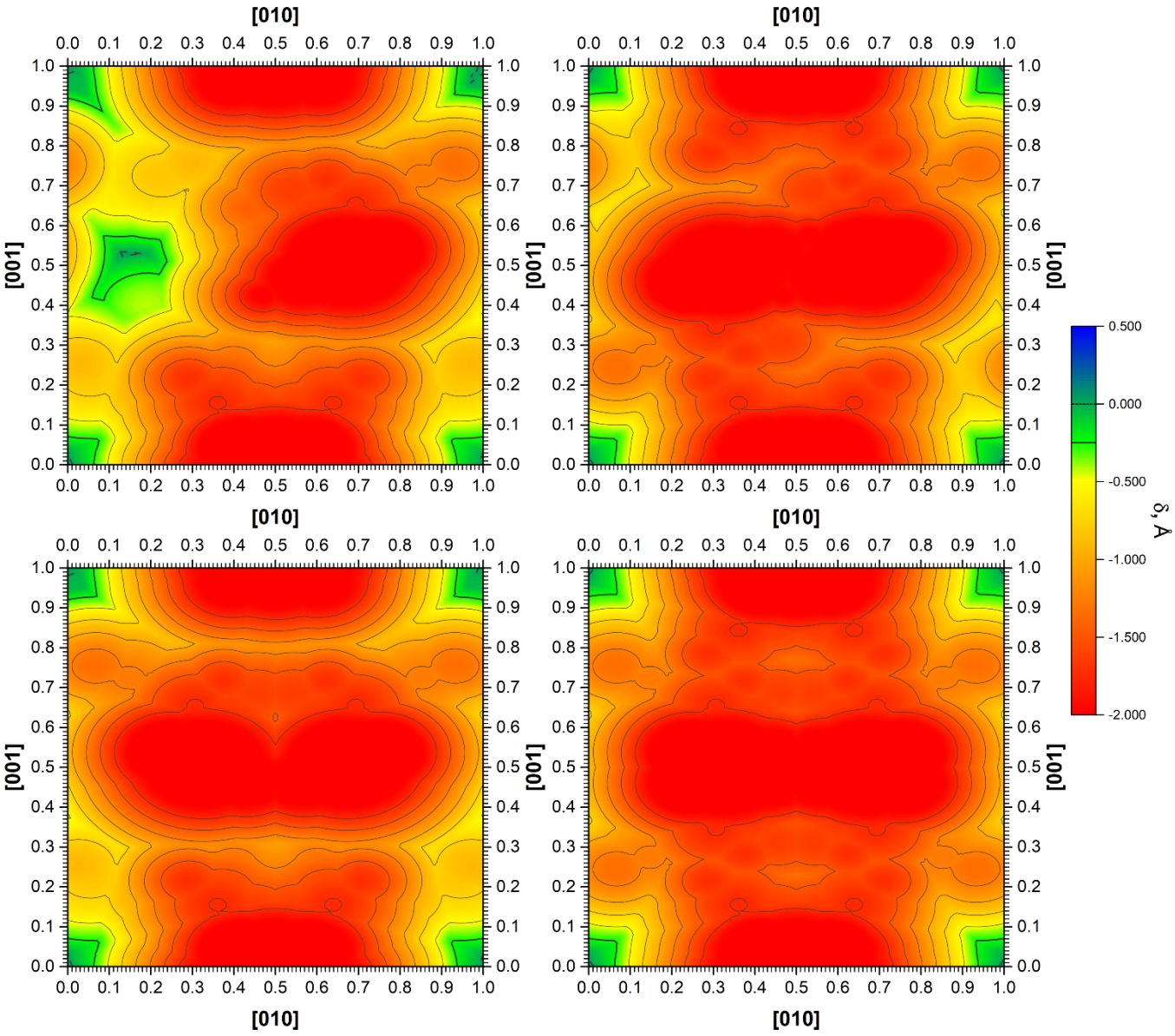

Figure S16. 2D-maps of the parameter δ during the displacement of the mobile DBU to the fixed part within the (100) crystallographic layer calculated using four model systems extracted from the crystal structure of the ibuprofen polymorphic form **I** under the pressure of **1.89 GPa**.

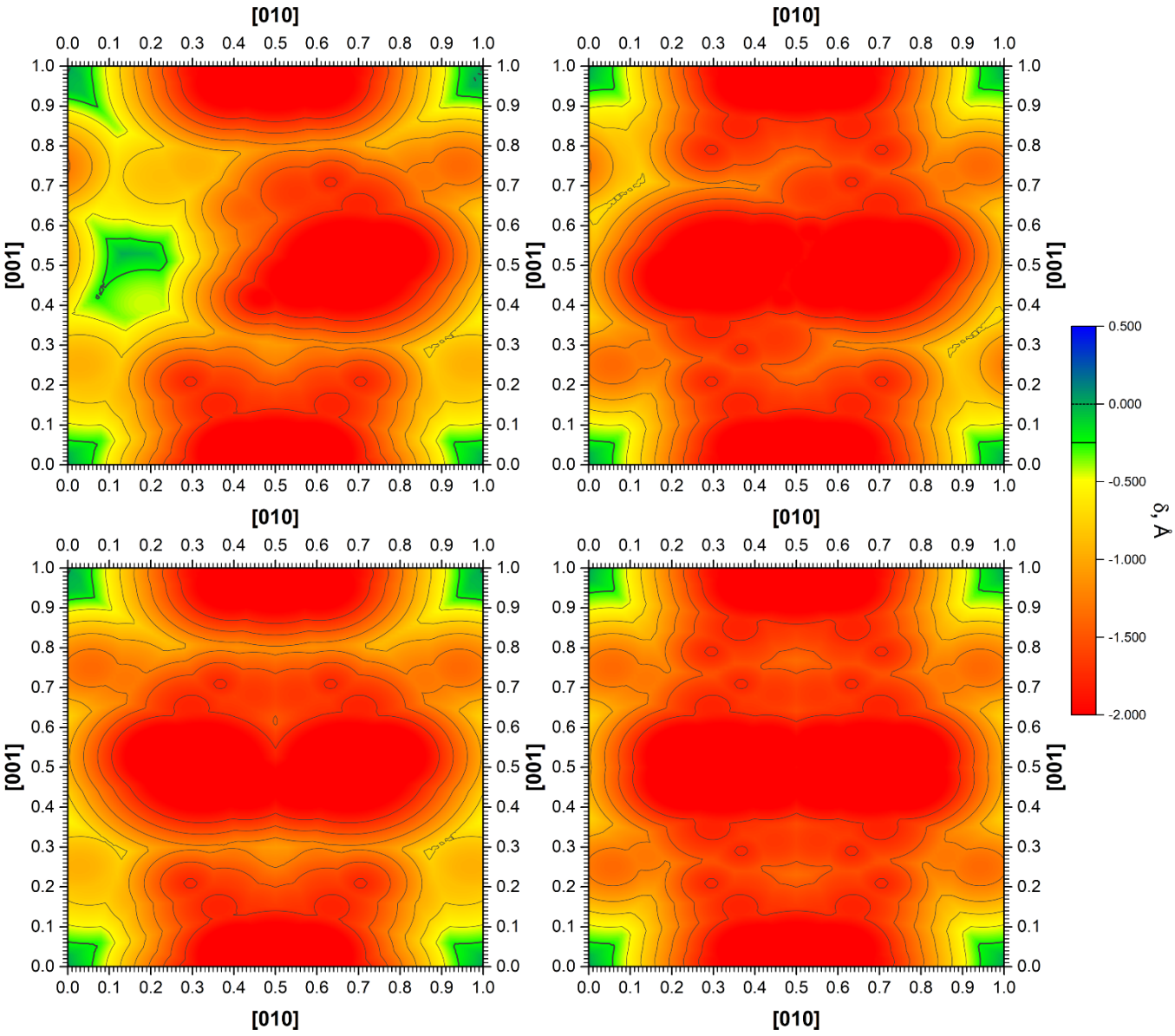

Figure S17. 2D-maps of the parameter δ during the displacement of the mobile DBU to the fixed part within the (100) crystallographic layer calculated using four model systems extracted from the crystal structure of the ibuprofen polymorphic form **I** under the pressure of **2.32 GPa**.

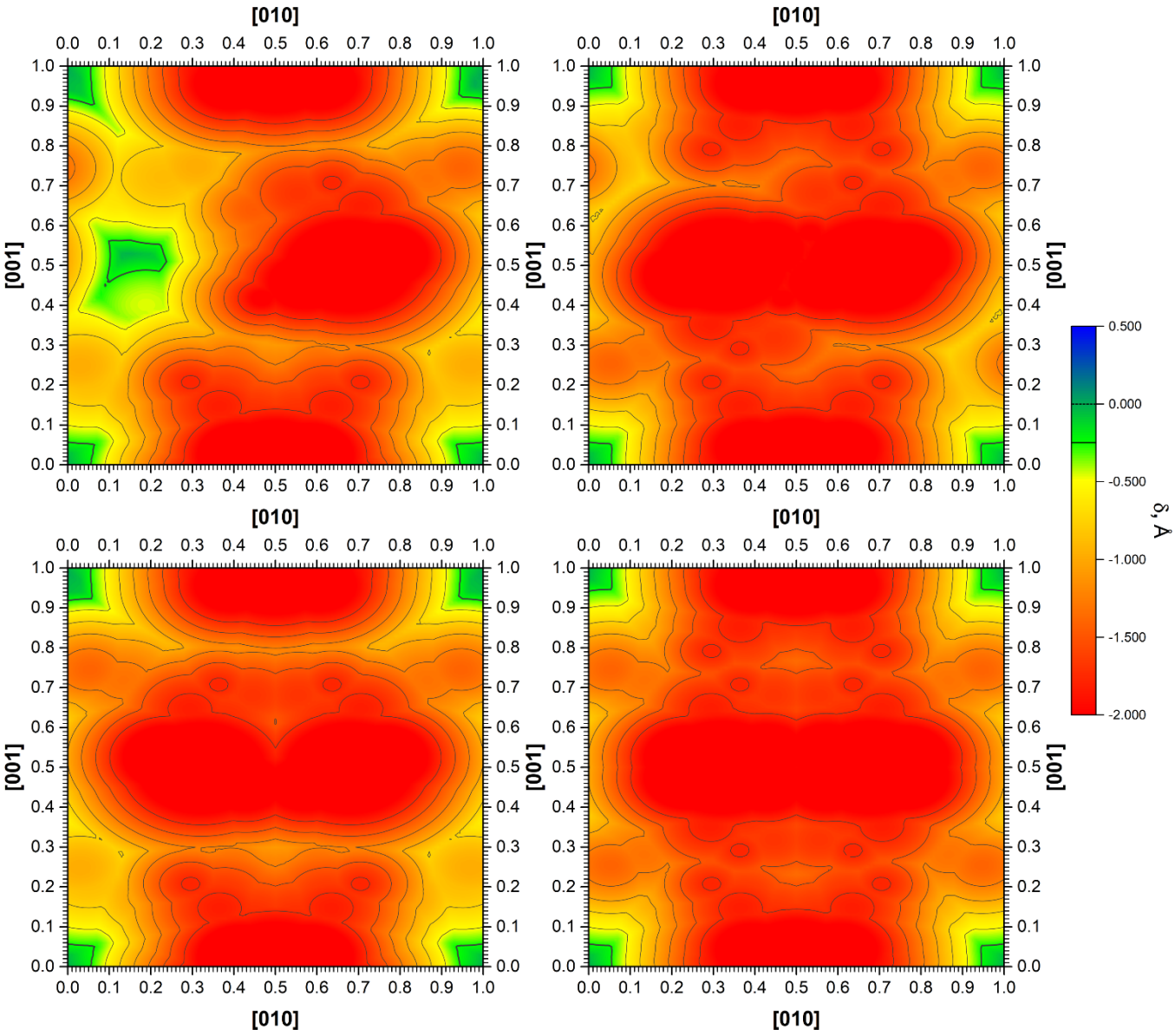

Figure S18. 2D-maps of the parameter δ during the displacement of the mobile DBU to the fixed part within the (100) crystallographic layer calculated using four model systems extracted from the crystal structure of the ibuprofen polymorphic form **I** under the pressure of **2.65 GPa**.

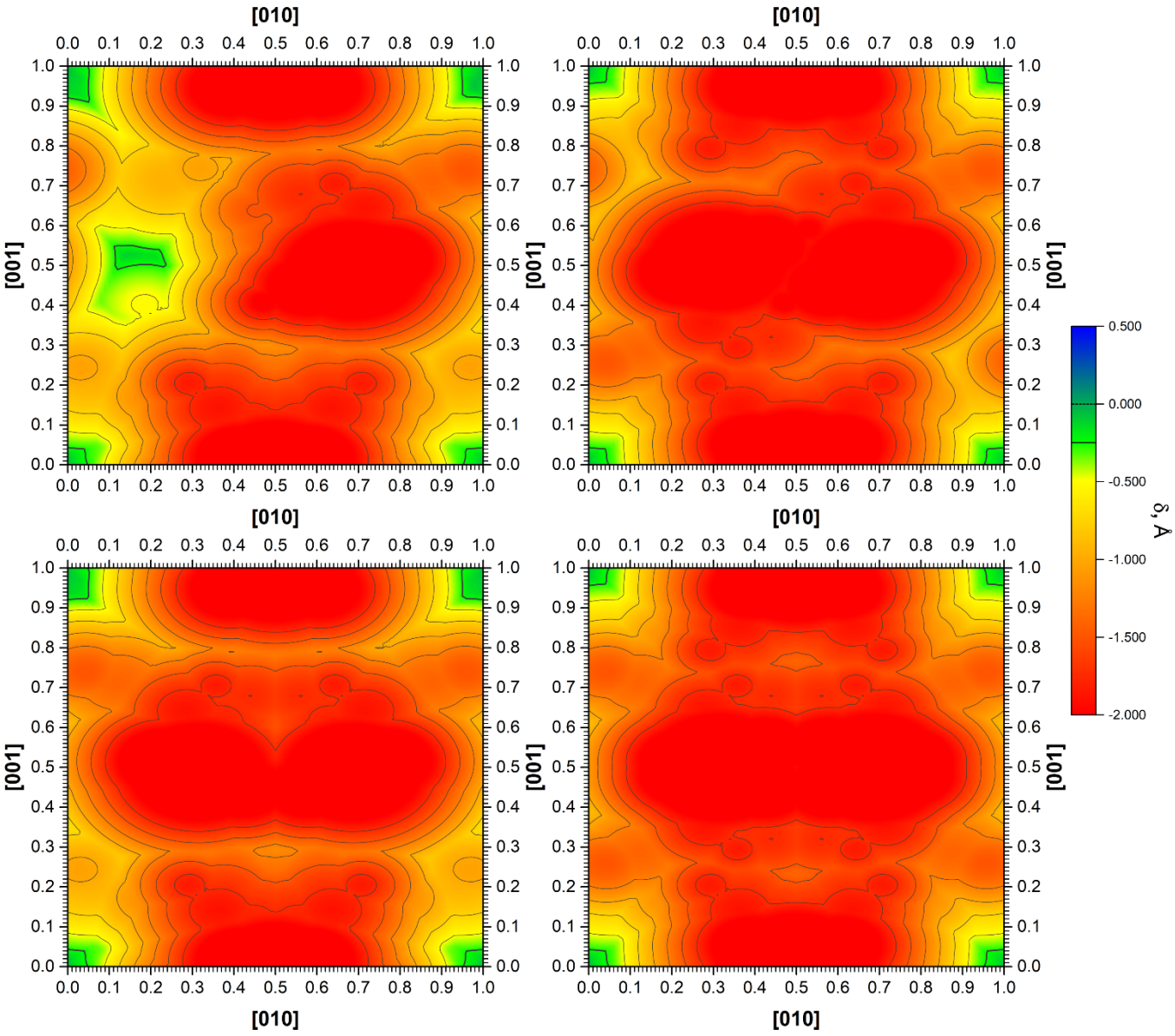

Figure S19. 2D-maps of the parameter δ during the displacement of the mobile DBU to the fixed part within the (100) crystallographic layer calculated using four model systems extracted from the crystal structure of the ibuprofen polymorphic form **I** under the pressure of **3.46 GPa**.

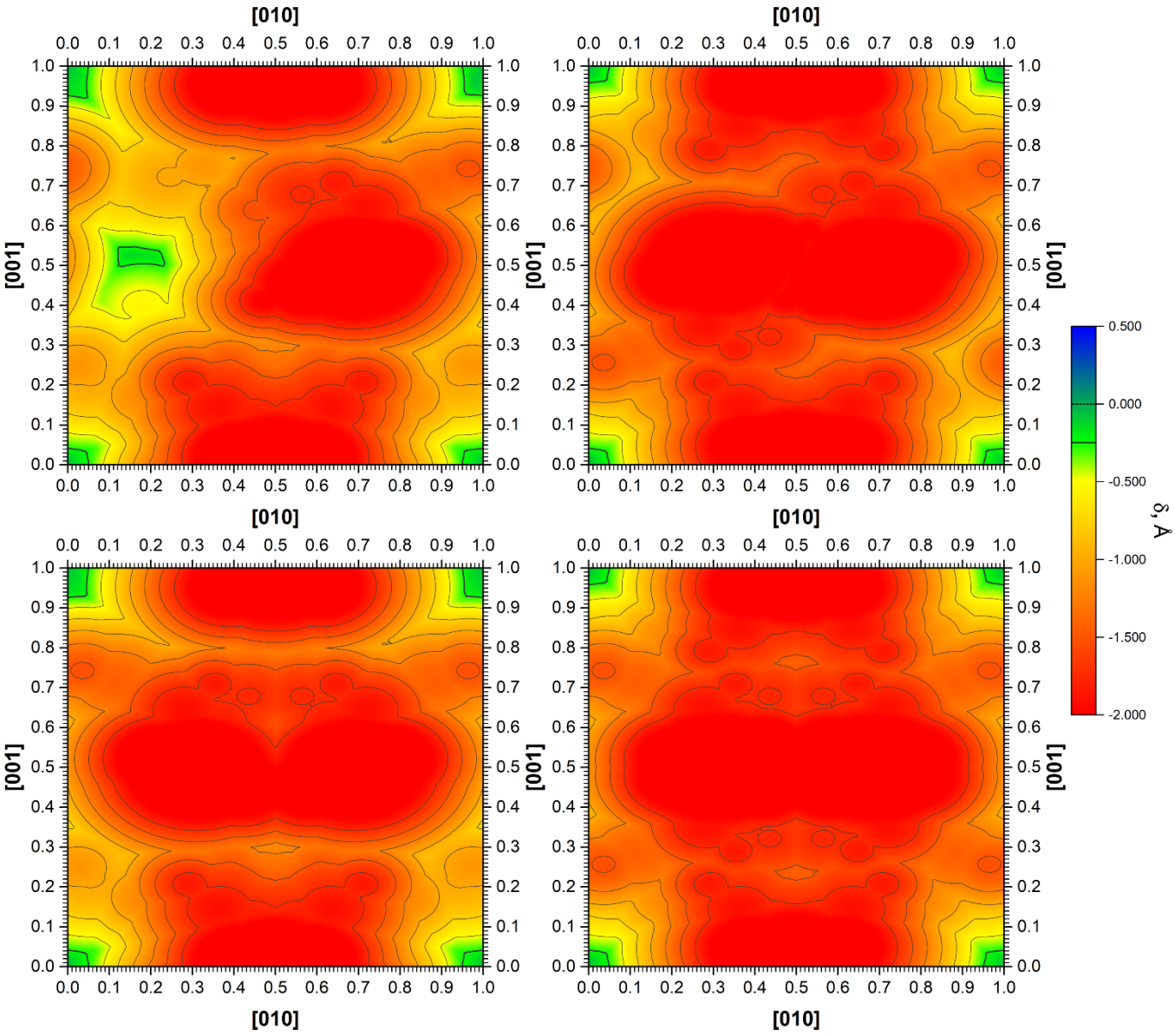

Figure S20. 2D-maps of the parameter δ during the displacement of the mobile DBU to the fixed part within the (100) crystallographic layer calculated using four model systems extracted from the crystal structure of the ibuprofen polymorphic form **I** under the pressure of **4.00 GPa**.

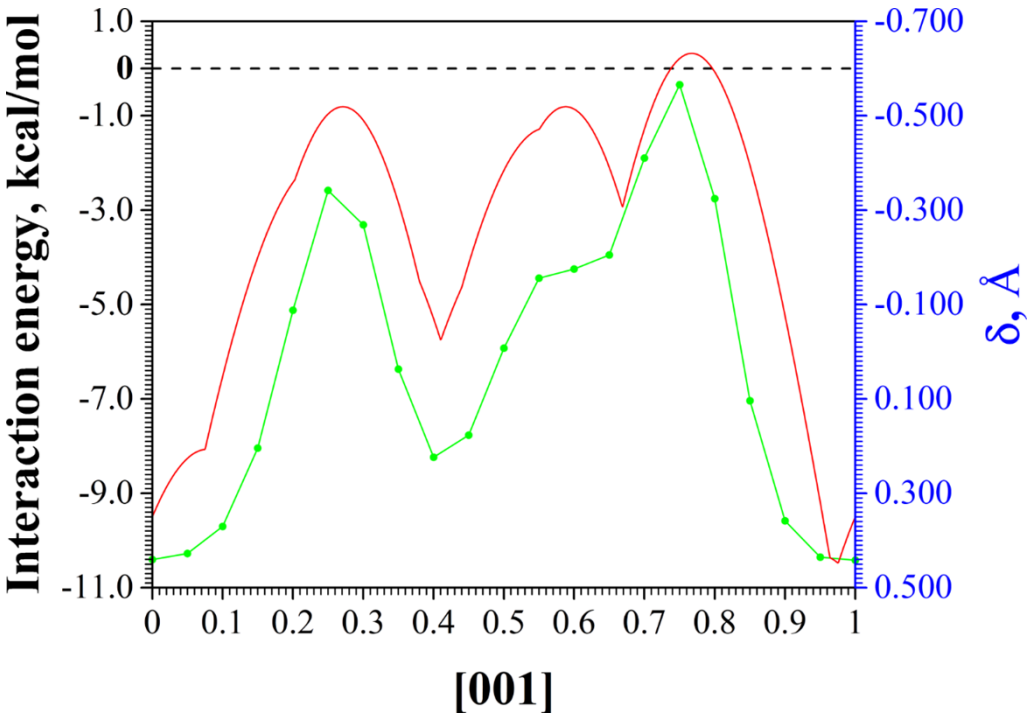

Figure S21. Profiles of interaction energy (bright green) and topological parameter δ (red) occurring during the shear of the dimeric building unit(s) along the direction **[001]** in parallel to a neighboring layer **(100)** with lower coordinate *a* in the crystals of the polymorphic modification **I** of ibuprofen **under ambient pressure**. The line of zero energy is marked as the black dashed one.

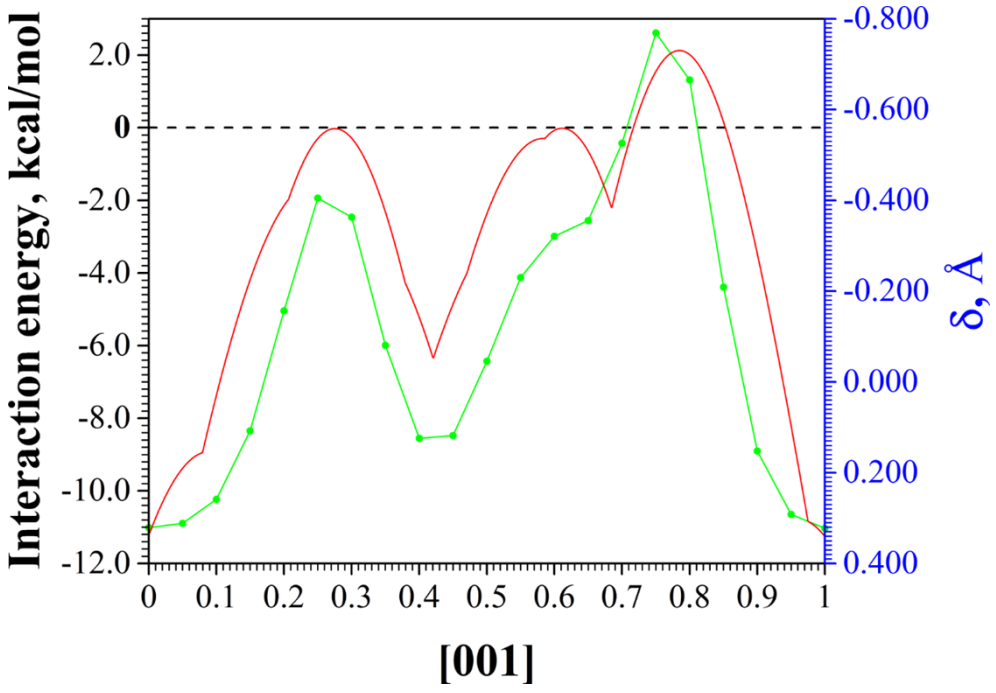

Figure S22. Profiles of interaction energy (bright green) and topological parameter δ (red) occurring during the shear of the dimeric building unit(s) along the direction **[001]** in parallel to a neighboring layer **(100)** with lower coordinate *a* in the crystals of the polymorphic modification **I** of ibuprofen at the pressure of **0.23 GPa**. The line of zero energy is marked as the black dashed one.

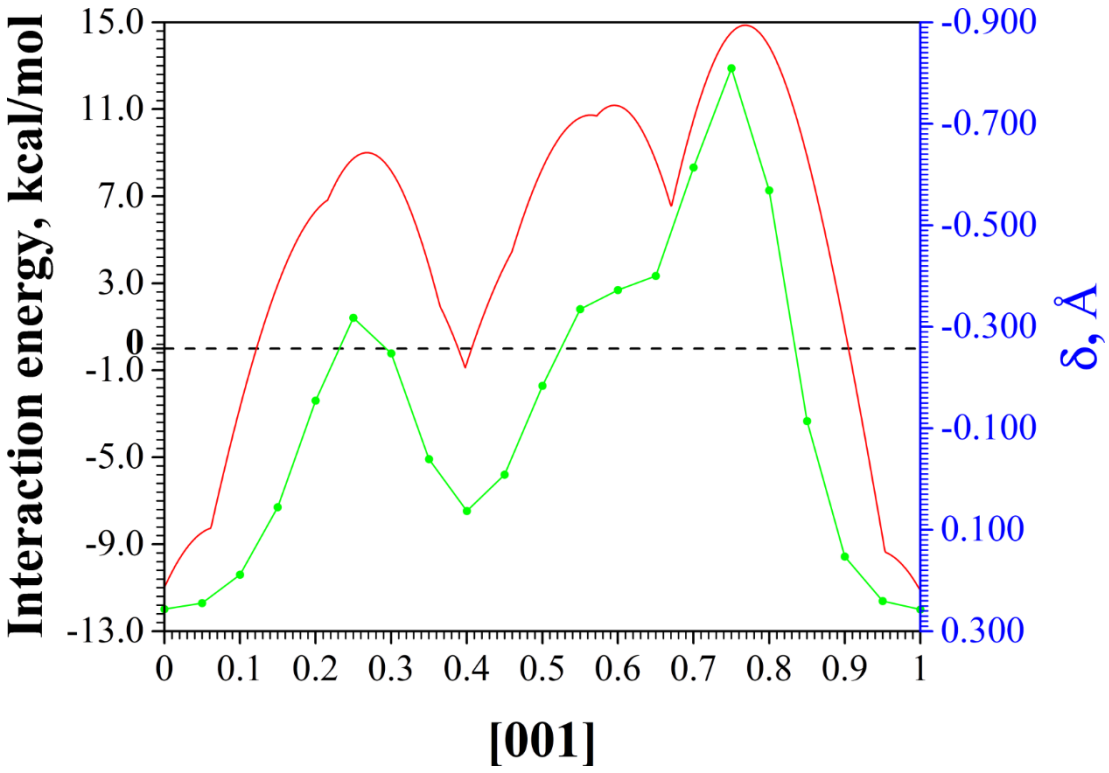

Figure S23. Profiles of interaction energy (bright green) and topological parameter δ (red) occurring during the shear of the dimeric building unit(s) along the direction **[001]** in parallel to a neighboring layer **(100)** with lower coordinate *a* in the crystals of the polymorphic modification **I** of ibuprofen at the pressure of **0.60 GPa**. The line of zero energy is marked as the black dashed one.

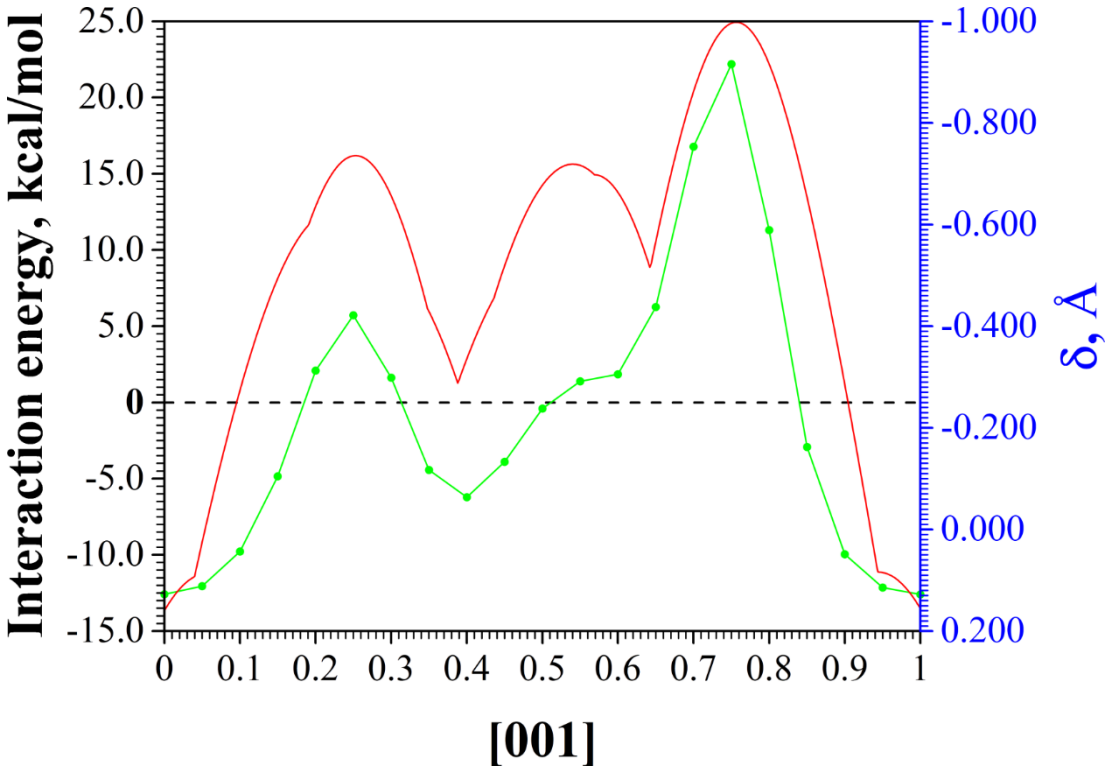

Figure S24. Profiles of interaction energy (bright green) and topological parameter δ (red) occurring during the shear of the dimeric building unit(s) along the direction **[001]** in parallel

to a neighboring layer **(100)** with lower coordinate *a* in the crystals of the polymorphic modification **I** of ibuprofen at the pressure of **0.80 GPa**. The line of zero energy is marked as the black dashed one.

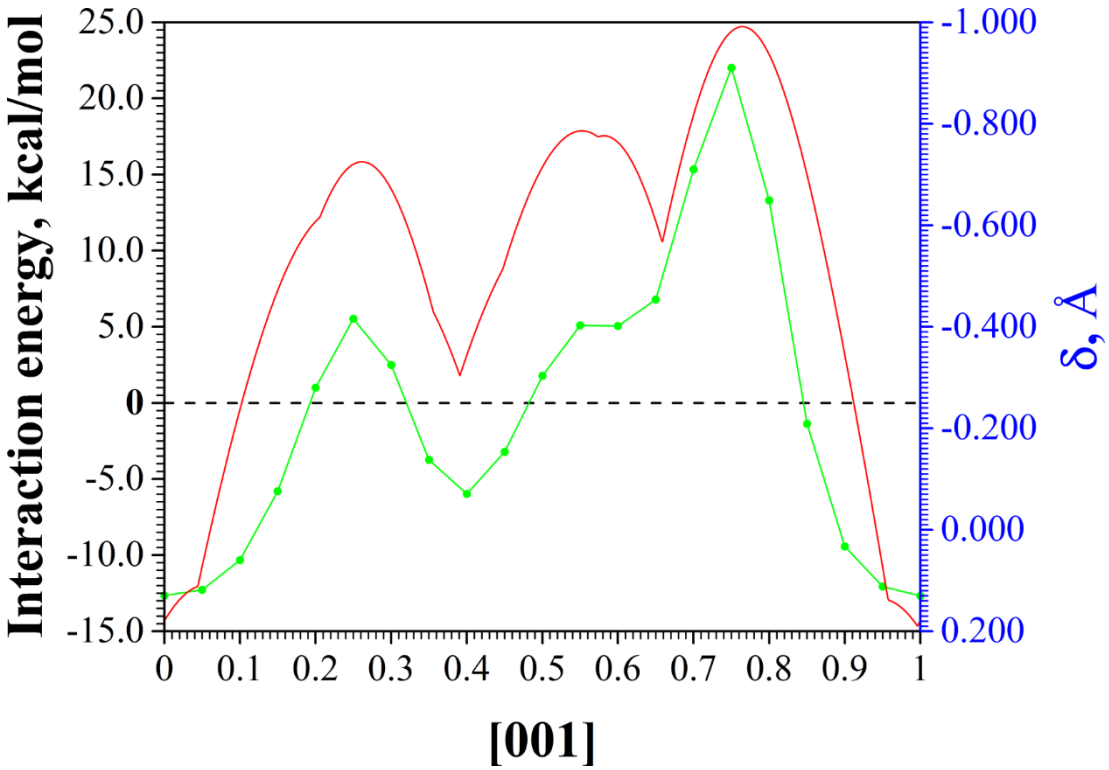

Figure S25. Profiles of interaction energy (bright green) and topological parameter δ (red) occurring during the shear of the dimeric building unit(s) along the direction **[001]** in parallel to a neighboring layer **(100)** with lower coordinate *a* in the crystals of the polymorphic modification **I** of ibuprofen at the pressure of **0.88 GPa**. The line of zero energy is marked as the black dashed one.

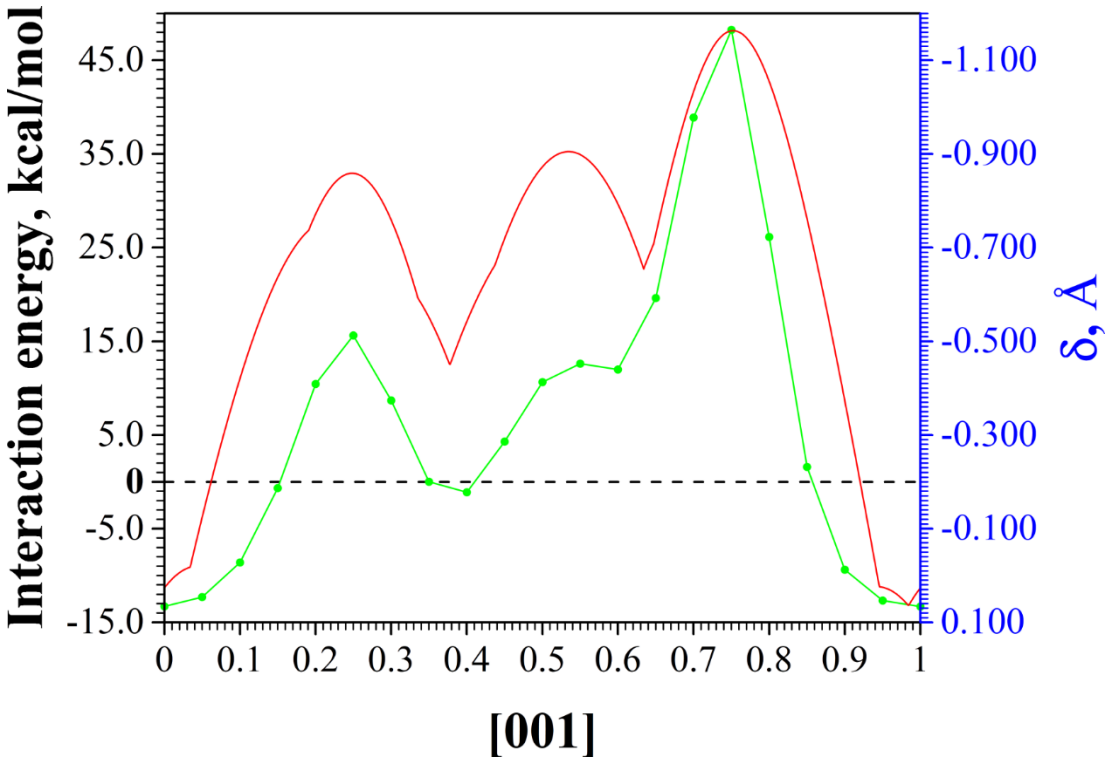

Figure S26. Profiles of interaction energy (bright green) and topological parameter δ (red) occurring during the shear of the dimeric building unit(s) along the direction **[001]** in parallel to a neighboring layer **(100)** with lower coordinate *a* in the crystals of the polymorphic modification **I** of ibuprofen at the pressure of **1.70 GPa**. The line of zero energy is marked as the black dashed one.

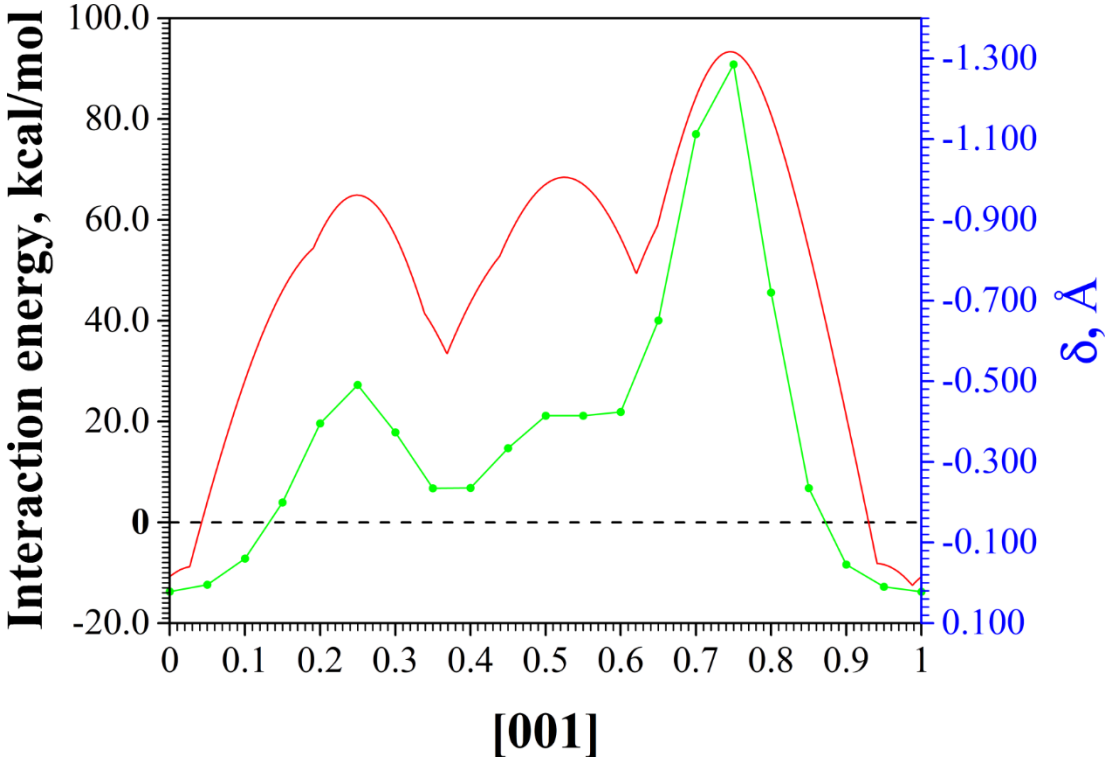

Figure S27. Profiles of interaction energy (bright green) and topological parameter δ (red) occurring during the shear of the dimeric building unit(s) along the direction **[001]** in parallel to a neighboring layer **(100)** with lower coordinate *a* in the crystals of the polymorphic

modification **I** of ibuprofen at the pressure of **2.65 GPa**. The line of zero energy is marked as the black dashed one.

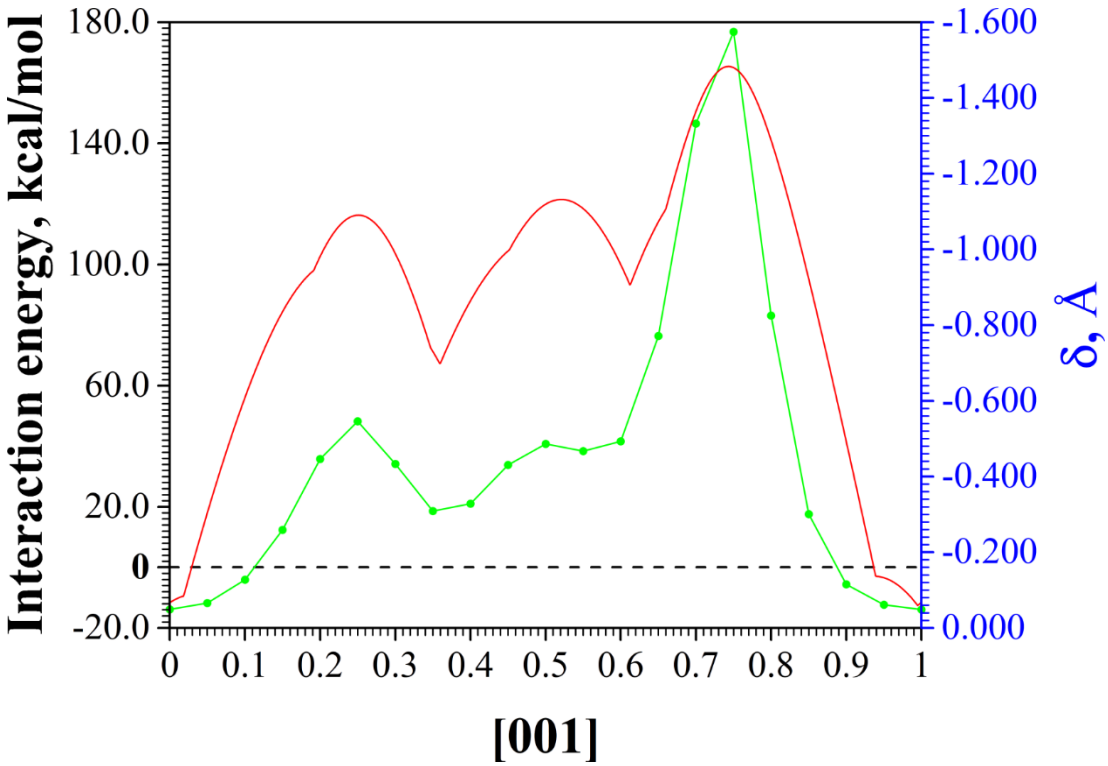

Figure S28. Profiles of interaction energy (bright green) and topological parameter δ (red) occurring during the shear of the dimeric building unit(s) along the direction **[001]** in parallel to a neighboring layer **(100)** with lower coordinate *a* in the crystals of the polymorphic modification **I** of ibuprofen at the pressure of **4.00 GPa**. The line of zero energy is marked as the black dashed one.