Relativity-Induced Ordering and Phase Separation in Intermetallic Compounds

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First, deform hydrostatically pure A and B from their equilibrium volumes V_A and V_B to the volume V akin to the final compound α with composition x. In doing so we invest a

Since the input to eq. (6) is a set $\{\Delta H_f(\sigma)\}$ of formation enthalpies for ordered compounds

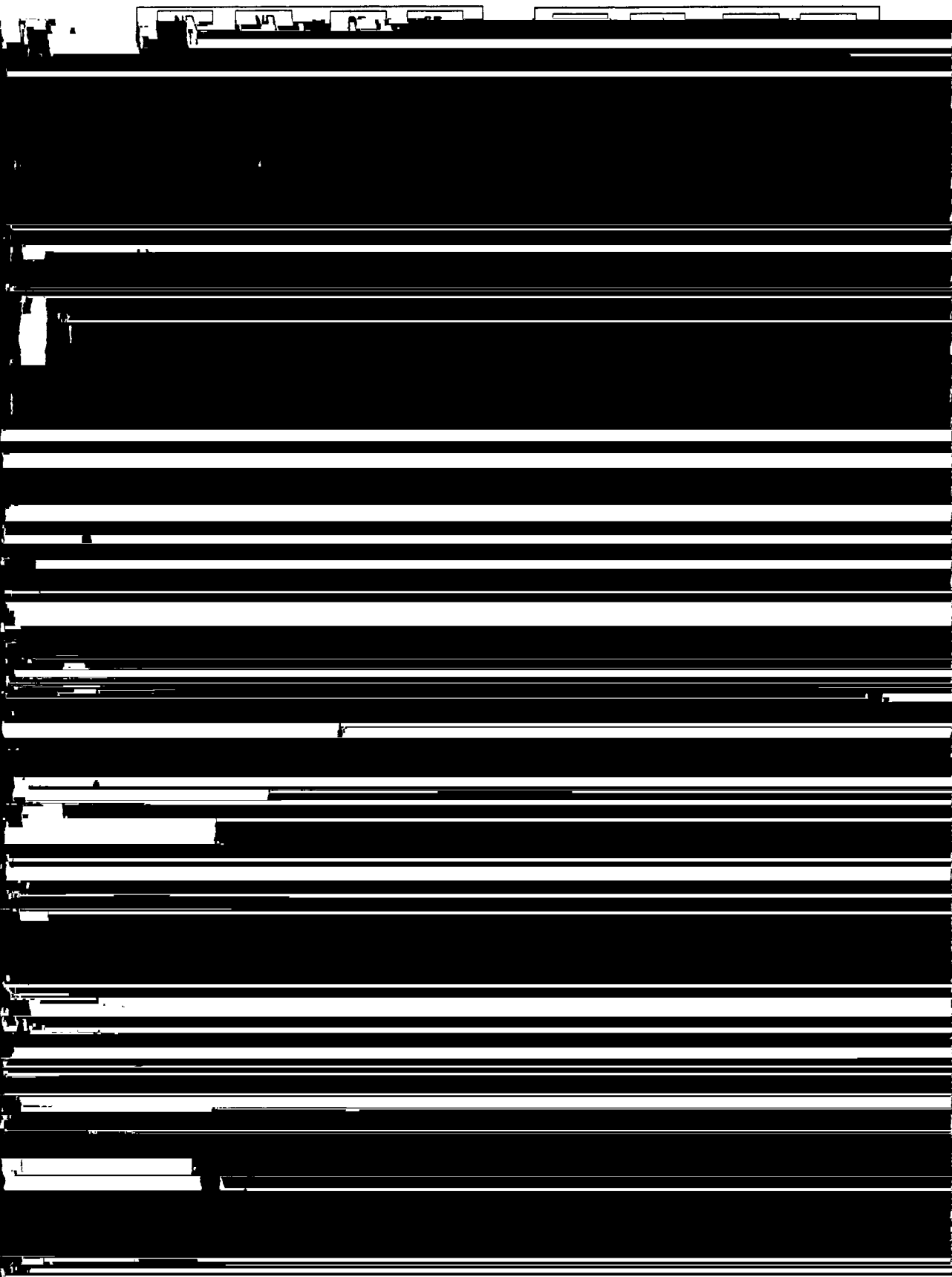

TABLE I. – *Contributions of volume deformation* (VD), *charge exchange* (CE), *and relaxation* (REL) *to*

	Nonrelativistic		Relativistic	
	$L1_0$	Random	$L1_0$	Random
$Ni_{0.5}Pt_{0.5}$				
ΔE_{VD}	+ 543.6	+ 543.6	+ 426.8	+ 426.8
ΔE_{CE}	− 398.4	− 307.0	− 504.5	− 403.3
ΔE_{REL}	− 51.6	− 60.5	− 18.0	− 53.8
ΔH	+ 93.6	+ 176.1	− 95.7	− 30.3
δE_{ord}	− 82.5	—	− 65.4	—
$Au_{0.5}Pt_{0.5}$				
ΔE_{VD}	+ 42.3	+ 42.3	+ 48.6	+ 48.6
ΔE_{CE}	− 113.5	− 103.5	+ 28.2	+ 1.5
ΔE_{REL}	~ 0	~ 0	~ 0	~ 0
ΔH	− 71.2	− 61.2	+ 76.8	+ 50.1
δE_{ord}	− 10.0	—	+ 26.7	—
$Ni_{0.5}Au_{0.5}$				
ΔE_{VD}	+ 722.2	+ 722.2	+ 561.8	+ 561.8
ΔE_{CE}	− 337.8	− 283.8	− 464.8	− 369.2
ΔE_{REL}	− 11.9	− 82.5	− 20.2	− 68.3
ΔH	+ 372.5	+ 355.9	+ 76.8	+ 124.3
δE_{ord}	+ 16.6	—	− 47.5	—

stabilization. The same effects exist in other compounds in which only *one* of the two