1 Variables

2 root

	var	symbol	documentation	type	units	tokens	eqs
1	$F_{N,A}$	F	incidence matrix of directed graph	network			
2	t	t	time	frame	s		
3	#	value	numerical value	constant			
4	1	one	numerical value 1	constant			1
5	0	zero	numerical value 0	constant			2
6	1/2	onehalf	numerical value $1/2$	constant			3

3 physical

	var	symbol	documentation	type	units	tokens	eqs
10	$F_{NS,AS}$	F_NS_AS	blick incidence matrix of directed species graph	network			6
9	$P_{NS,AS}$	P_NS_AS	node species to arc species projection	projection			
11	$P_{K,NK}$	P_K_NK	projection of conversion to node x conversion	projection			
12	$P_{NS,KS}$	P_NS_KS	projection node x species to conversion x species	projection			
13	$P_{N,NK}$	P_N_NK	projection node to node x conversion	projection			
14	$P_{NK,KS}$	P_NK_KS	projection node x conversion to conversion x species	projection			
15	r_{xN}	r_x	x-coordinate	frame	m		
16	r_{y_N}	r_y	y-coordinate	frame	m		
17	r_{zN}	r_z	z-coordinate	frame	m	[]	

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	var	symbol	documentation	type	units	tokens	eqs
18	n_{NS}	n	foundation state – species mass	state	mol	['mass']	
19	U_N	U	foundation state – internal energy	state	kgm^2s^{-2}	['energy']	
20	S_N	S	foundation state – entropy	state	$kg m^2 K^{-1} s^{-2}$		
21	V_N	V	foundation state – volume	state	m^3		
29	H_N	Н	enthalpy	state	kgm^2s^{-2}	['energy']	13
30	A_N	A	Helmholtz energy	state	kgm^2s^{-2}	['energy']	14
31	G_N	G	Gibbs energy	state	kgm^2s^{-2}	['energy']	15
26	N^o	No	Avogadro number	constant			10
27	B_N	В	Boltzmann constant	constant	$kg m^2 K^{-1} s^{-2}$		11
28	R_N	R	gas constant	constant	$kg m^2 K^{-1} s^{-2}$		12
22	p_N	р	thermodynamic pressure	effort	$kgm^{-1}s^{-2}$	['energy']	7
23	T_N	T	temperature	effort	K	['energy']	8
24	μ_{NS}	mu	chemical potential	effort	$kgm^2mol^{-1}s^{-2}$	['energy', 'mass']	9
36	v_{xN}	v_x	velocity in x-direction	seconaryState	ms^{-1}		20
37	v_{y_N}	v_y	velocity in y-direction	seconaryState	ms^{-1}		21
38	v_{zN}	v_z	velocity in z-direction	seconaryState	ms^{-1}		22
39	v_N	v	velocity vector	seconaryState	ms^{-1}		23

4 control

	var	symbol	documentation	type	units	tokens	eqs
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5 reactions

6 material var 7 macrosce var 8 solid	symbol	documentation	type	units	tokens	eqs								
7 macrosc	opic		type	units	tokens	eqs								
var														
	symbol	1				7 macroscopic								
8 solid		documentation	type	units	tokens	eqs								
	$8 \mathrm{solid}$													
var	symbol	documentation	type	units	tokens	eqs								
9 fluid														
var	symbol	documentation	type	units	tokens	eqs								
10 liquid														
var	symbol	documentation	type	units	tokens	eqs								

11 gas

	var	symbol	documentation	type	units	tokens	eqs			
12										
	var	symbol	documentation	type	units	tokens	eqs			
13 reactions-control										
	var	symbol	documentation	type	units	tokens	eqs			
14 control-material										
	var	symbol	documentation	type	units	tokens	eqs			
15	15 material—control									
	var	symbol	documentation	type	units	tokens	eqs			
16 control-macroscopic										
	var	symbol	documentation	type	units	tokens				

17 macroscopic-control

	var	symbol	documentation	type	units	tokens	eqs			
	742			l of Po	direc	- CONCINS	eqs			
18	reactions-material									
	var	symbol	documentation	type	units	tokens	eqs			
19	19 material—reactions									
19	material-react	ions								
	var	symbol	documentation	type	units	tokens	eqs			
20	reactions-macroscopic									
	var	symbol	documentation	type	units	tokens	eqs			
21	macroscopic-reactions									
	var	symbol	documentation	type	units	tokens	eqs			
22	material-macroscopic									
	var	symbol	documentation	type	units	tokens	eqs			

	var	symbol	documentation	type	units	tokens	eqs			
24	$24~~{ m gas-liquid}$									
	var	symbol	documentation	type	units	tokens	eqs			
25	gas–solid									
	var	symbol	documentation	type	units	tokens	eqs			
26										
	var	symbol	documentation	type	units	tokens	eqs			

27 Equations

27.1 Model equations

no	equation	documentation	layer
1	1 := Set(#, #)	numerical value 1	root
2	0 := Set(#, #)	numerical value 1	root
3	1/2 := Set(#,#)	numerical value $1/2$	root
6	$F_{NS,AS} := F_{N,A} \odot P_{NS,AS}$	blick incidence matrix of directed species graph	physical
7	$p_N := \frac{\partial U_N}{\partial V_N}$	thermodynamic pressure	physical
8	$T_N := \frac{\partial U_N}{\partial S_N}$	temperature	physical
9	$\mu_{NS} := \frac{\partial U_N}{\partial n_{NS}}$	chemical potential	physical
10	$N^o := Set(\#,\#)$	Avogadro number	physical
11	$B_N := Set(S_N, \#)$	Boltzmann constant	physical
12	$R_N := B_N \cdot N^o$	gas constant	physical
13	$H_N := U_N + p_N \cdot V_N$	enthalpy	physical
14	$A_N := U_N - T_N . S_N$	Helmholtz energy	physical
15	$G_N := U_N + p_N \cdot V_N - T_N \cdot S_N$	Gibbs energy	physical
20	$v_{xN} := \frac{\partial r_{xN}}{\partial t}$	velocity in x-direction	physical
21	$v_{y_N} := \frac{\partial r_{y_N}}{\partial t}$	velocity in y-direction	physical

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no	equation	documentation	layer
22	$v_{zN} := \frac{\partial r_{zN}}{\partial t}$	velocity in z-direction	physical
23	$v_N := Stack\left(v_{xN}, v_{y_N}, v_{z_N}\right)$	velocity vector	physical