Thermodynamic data of $Sr_2P_2O_7$, $Ba_2P_2O_7$ and $Ra_2P_2O_7$

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Table 1

Comparison of various thermodynamic data for the low-temperature phase of $Ca_2P_2O_7$: from room temperature to 1023 K.

T, K	C_p, J·mol^{-1}·K^{-1}		Δ, %	$H_T–H_{298}$, kJ·mol^{-1}		Δ, %	$S_T–S_{298}$, J·mol^{-1}·K^{-1}		Δ, %	$\Phi_T–\Phi_{298}$, J·mol^{-1}·K^{-1}		Δ, %
	[6]	[7]		[6]	[7]		[6]*	[7]		[6]*	[7]	
300	188.523	188.103	-0.223	0.348	0.347	-0.287	1.164	1.161	-0.258	0.004	0.004	0.000
400	217.396	217.731	0.154	20.806	20.799	-0.034	59.821	59.796	-0.041	7.805	7.799	-0.083
500	234.078	235.296	0.520	43.438	43.509	0.163	110.254	110.397	0.130	23.377	23.379	0.009
600	245.961	248.112	0.875	67.466	67.705	0.354	154.029	154.477	0.291	41.585	41.635	0.121
700	255.577	258.687	1.217	92.556	93.058	0.542	192.686	193.538	0.442	60.463	60.598	0.223
800	263.986	268.067	1.546	118.542	119.403	0.726	227.373	228.703	0.585	79.196	79.449	0.320
900	271.693	276.751	1.862	145.330	146.649	0.908	258.916	260.784	0.721	97.438	97.841	0.413
1000	278.964	285.005	2.166	172.866	174.740	1.084	287.921	290.373	0.852	115.055	115.633	0.502
1023	280.592	286.859	2.233	179.301	181.316	1.124	294.283	296.875	0.881	119.014	119.636	0.522

Note. * Values obtained as a result of data analysis from Barin [6].

Table 2

Comparison of various thermodynamic data for the medium- (from 1023 to 1413 K) and high- (from 1413 to 1631 K) temperature phases of $Ca_2P_2O_7$.

T, K	C_p, J·mol^{-1}·K^{-1}		Δ, %	$H_T–H_{298}$, kJ·mol^{-1}		Δ, %	$S_T–S_{298}$, J·mol^{-1}·K^{-1}		Δ, %	$\Phi_T–\Phi_{298}$, J·mol^{-1}·K^{-1}		Δ, %
	[6]	This work*		[6]	This work*		[6]**	This work*		[6]**	This work*	
Medium-temperature phase												
1023	280.592	286.859	2.233	180.975	181.316	0.188	295.920	296.875	0.323	119.014	119.636	0.522
1100	285.950	292.977	2.457	202.788	203.641	0.421	316.475	317.912	0.454	132.123	132.784	0.500
1200	292.742	300.756	2.738	231.724	233.329	0.693	341.649	343.740	0.612	148.546	149.299	0.507
1300	299.397	308.401	3.007	261.332	263.788	0.940	365.344	368.116	0.759	164.320	165.202	0.537
1400	305.953	315.947	3.267	291.600	295.006	1.168	387.772	391.248	0.896	179.487	180.529	0.581
1413	306.800	316.922	3.299	295.583	299.120	1.197	390.604	394.172	0.913	181.416	182.481	0.587
High-temperature phase												
1413	318.444	316.922	-0.478	302.361	299.120	-1.072	395.401	394.172	-0.311	181.416	182.481	0.587
1500	318.444	323.421	1.563	330.065	326.976	-0.936	414.428	413.301	-0.272	194.384	195.317	0.480
1600	318.444	330.839	3.892	361.910	359.689	-0.614	434.980	434.412	-0.131	208.786	209.606	0.393
1631	318.444	333.130	4.612	371.782	369.981	-0.484	441.091	440.782	-0.070	213.144	213.939	0.373

Notes:

* The main results were reported at a Scientific Conference (Vashkeba et al. [8]);

** Values obtained as a result of data analysis from Barin [6].

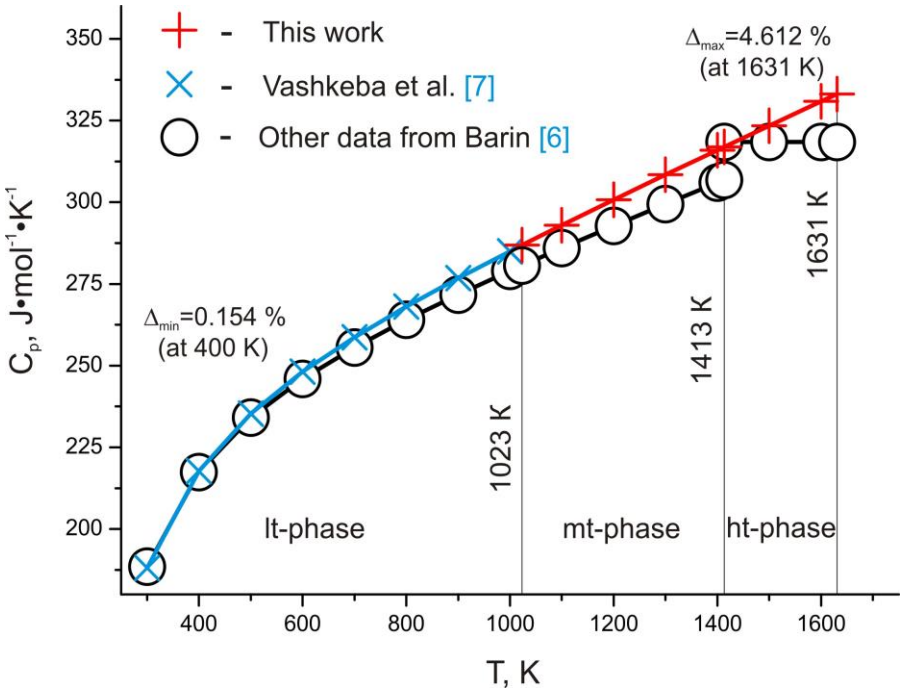

Fig. 1. Dependence of the heat capacity on temperature for the lt-, mt- and ht-phases of $Ca_2P_2O_7$.

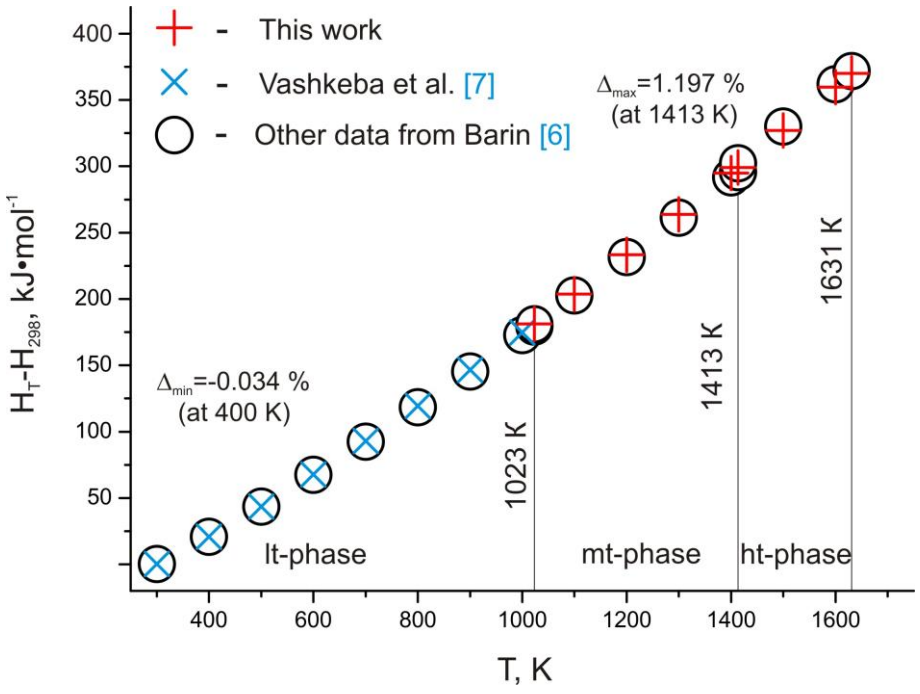

Fig. 2. Dependence of the enthalpy increment on temperature for the lt-, mt- and ht-phases of $Ca_2P_2O_7$.

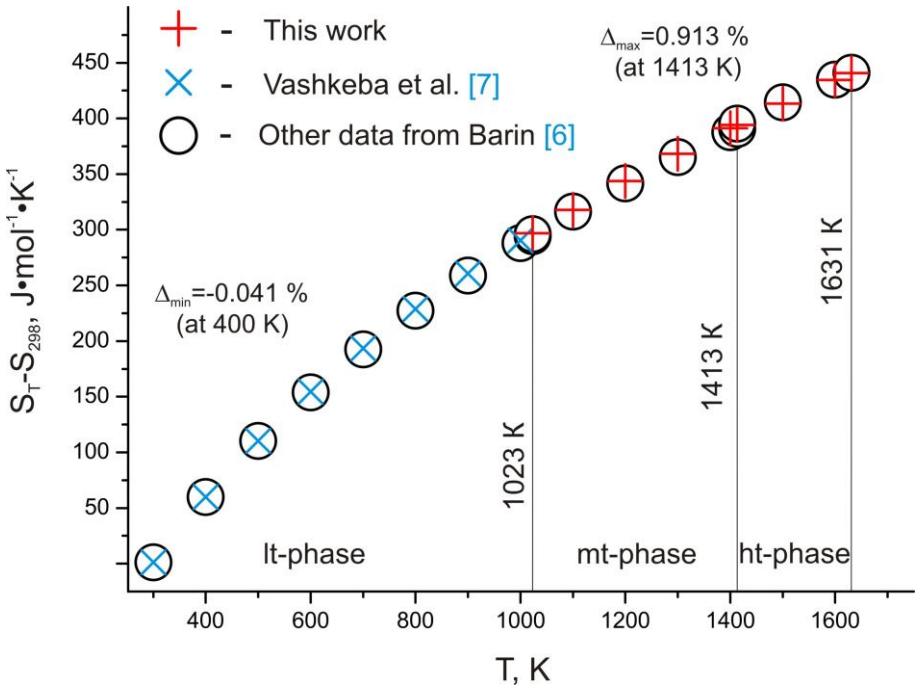

Fig. 3. Dependence of the entropy increment on temperature for the lt-, mt- and ht-phases of $Ca_2P_2O_7$.

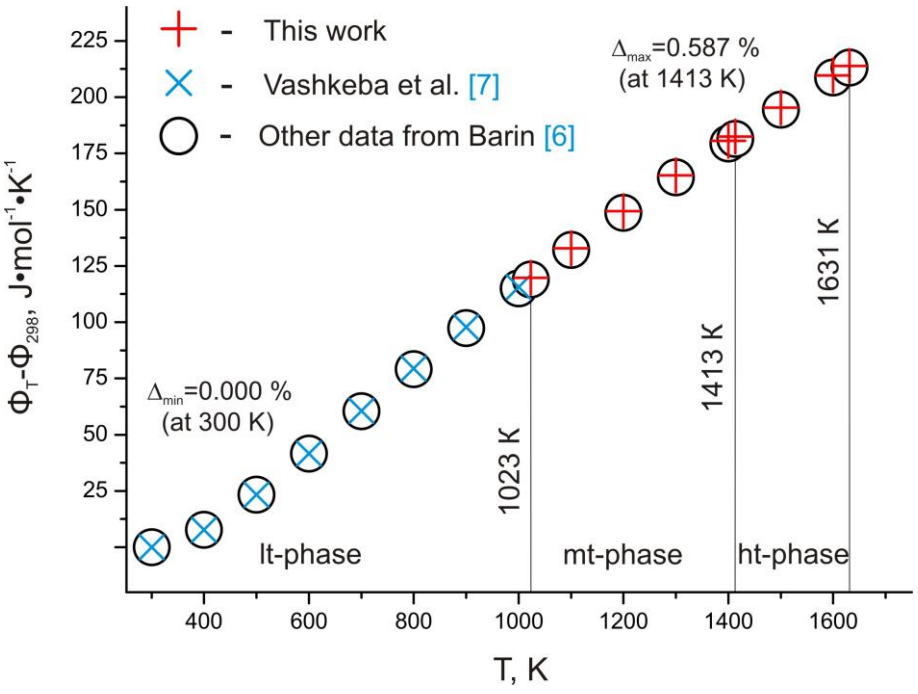

Fig. 4. Dependence of the Gibbs energy increment on temperature for the lt-, mt- and ht-phases of $Ca_2P_2O_7$.

Table 3

Thermodynamic data of $Sr_2P_2O_7$*.

T, K	C_p, J·mol^{-1}·K^{-1}	$H_T–H_{298}$, kJ·mol^{-1}	$S_T–S_{298}$, J·mol^{-1}·K^{-1}	$\Phi_T–\Phi_{298}$, J·mol^{-1}·K^{-1}
Low-temperature phase				
300	196.484	0.363	1.213	0.003
400	225.397	21.617	62.160	8.118
500	242.248	45.057	114.396	24.282
600	254.349	69.913	159.679	43.157
700	264.210	95.854	199.648	62.714
800	272.875	122.715	235.504	82.110
900	280.845	150.406	268.109	100.991
1000	288.384	178.870	298.092	119.222
1073	293.704	200.117	318.597	132.095
High-temperature phase				
1073	293.704	200.117	318.597	132.095
1100	295.641	208.073	325.920	136.763
1200	302.706	237.992	351.949	153.622
1300	309.636	268.610	376.452	169.829
1400	316.468	299.916	399.649	185.423
1500	323.227	331.901	421.714	200.447
1600	329.931	364.560	442.789	214.939
1648	333.133	380.473	452.589	221.719

Table 4

Thermodynamic data of $Ba_2P_2O_7$*.

T, K	C_p, J·mol^{-1}·K^{-1}	$H_T–H_{298}$, kJ·mol^{-1}	$S_T–S_{298}$, J·mol^{-1}·K^{-1}	$\Phi_T–\Phi_{298}$, J·mol^{-1}·K^{-1}
Low-temperature phase				
300	200.735	0.371	1.239	0.002
400	229.085	22.022	63.333	8.278
500	245.372	45.803	116.330	24.724
600	256.911	70.942	162.134	43.897
700	266.207	97.111	202.455	63.725
800	274.309	124.145	238.541	83.360
900	281.716	151.950	271.283	102.450
998	288.556	179.896	300.750	120.493
High-temperature phase				
998	288.556	179.896	300.750	120.493
1000	288.692	180.474	301.328	120.854
1100	295.386	209.679	329.159	138.542
1200	301.888	239.544	355.141	155.521
1300	308.254	270.053	379.557	171.824
1400	314.523	301.192	402.631	187.494
1500	320.719	332.955	424.543	202.573
1600	326.859	365.334	445.438	217.104
1700	332.957	398.325	465.437	231.128
1703	333.140	399.324	466.024	231.541

Table 5
Thermodynamic data of $Ra_2P_2O_7$*.

T, K	C_p, J·mol^{-1}·K^{-1}	$H_T–H_{298}$, kJ·mol^{-1}	$S_T–S_{298}$, J·mol^{-1}·K^{-1}	$\Phi_T–\Phi_{298}$, J·mol^{-1}·K^{-1}
300	202.576	0.374	1.251	0.004
400	230.911	22.209	63.872	8.350
500	247.184	46.171	117.275	24.933
600	258.707	71.492	163.407	44.254
700	267.990	97.839	204.005	64.235
800	276.077	125.050	240.327	84.015
900	283.469	153.032	273.277	103.241
1000	290.430	181.730	303.506	121.776
1100	297.109	211.109	331.502	139.585
1200	303.596	241.145	357.633	156.679
1300	309.948	271.823	382.186	173.091
1400	316.202	303.132	405.385	188.862
1500	322.383	335.061	427.412	204.038
1600	328.509	367.606	448.413	218.659
1676	333.136	392.749	463.765	229.428

Note to Tables 3-5: * The main results were reported at the Scientific Conference (Kozma et al. [14]). Only 9-10 % of these data were published in the Conference Proceedings [14].

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