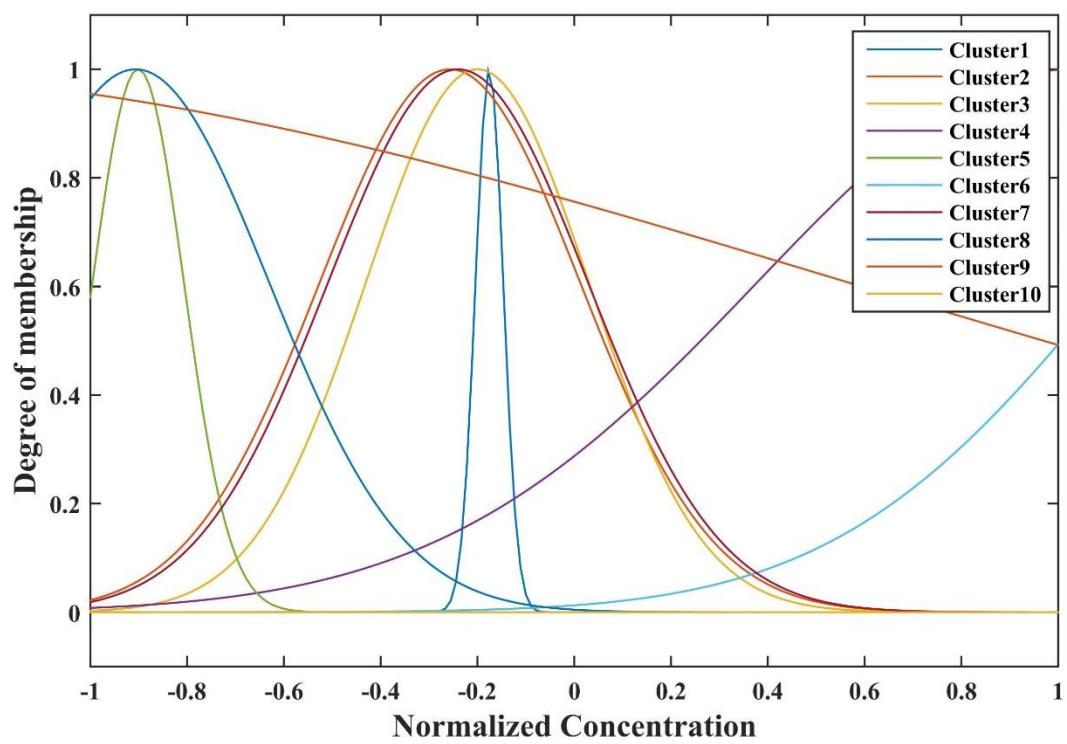


Table S1. ILs properties which was selected as parameters of the four models (Valderrama and Robles, 2007; Valderrama et al., 2008).

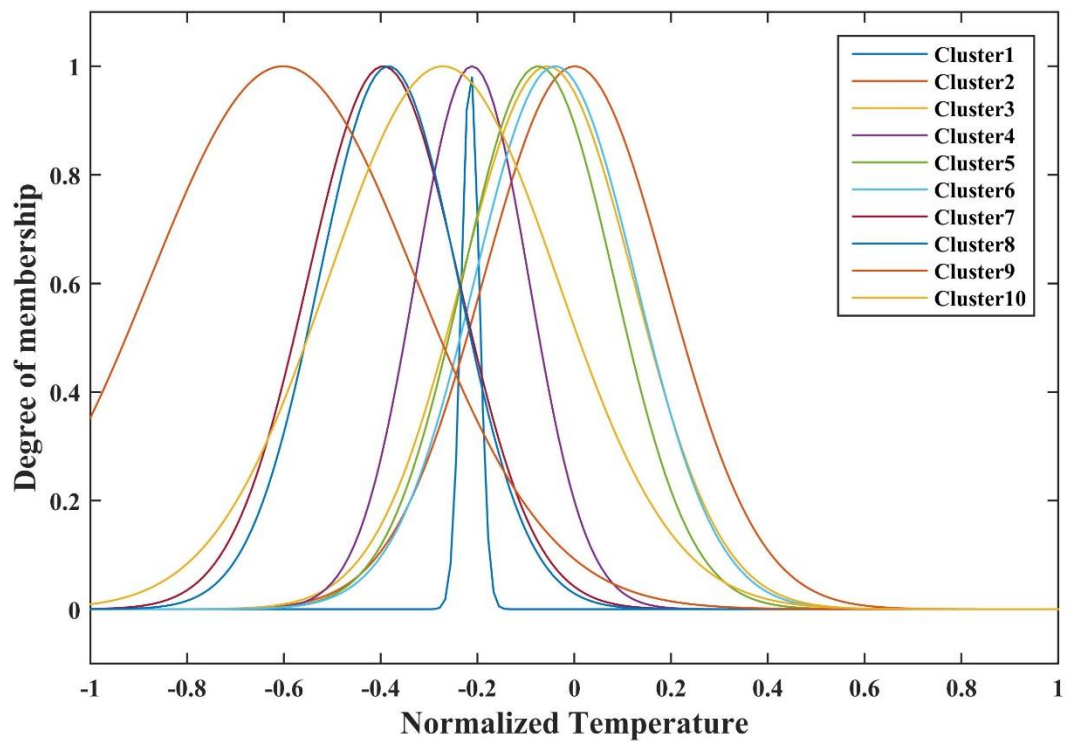
IL	Mw (gr/grmol)	Tc (K)	ω
[C4mim][NTf ₂]	419.2	1265.0	0.2656
[C4mmim][NTf ₂]	433.3	1275.9	0.3093
[C4mpyrr][NTf ₂]	422.4	1110.1	0.2383
[N4111][NTf ₂]	396.3	1038.7	0.3334

Table S2. Optimal weight and bias values for the MLP-ANN.

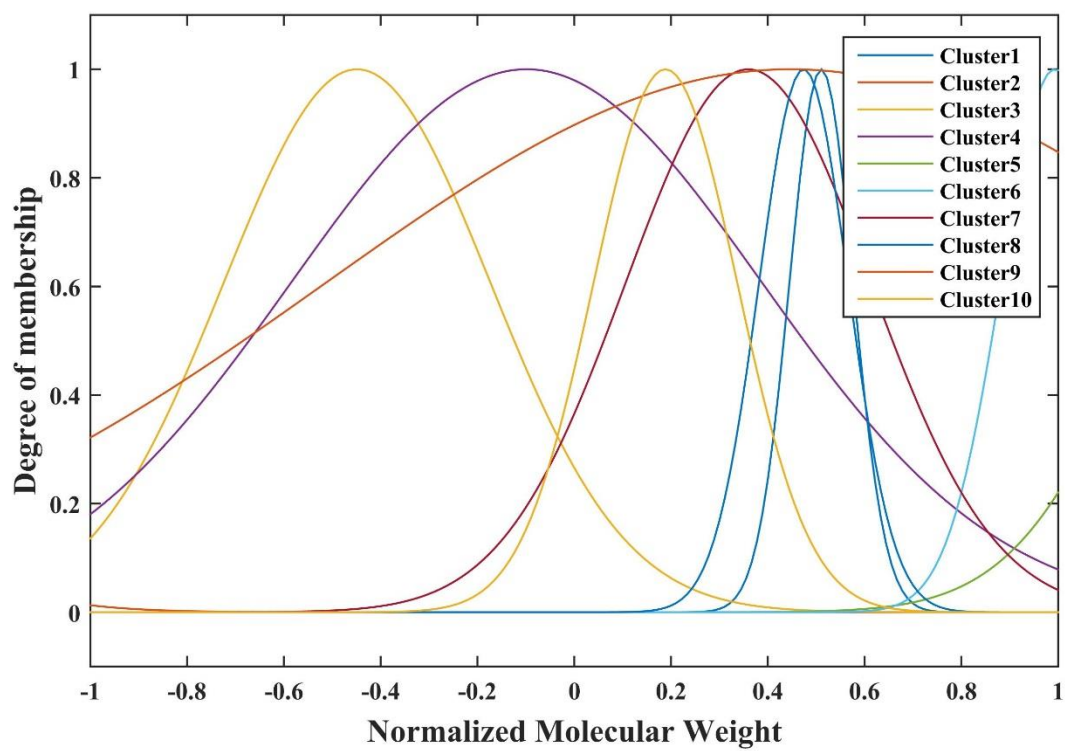
	Hidden layer						Output layer	
	Weight					Bias	Weight	Bias
Neuron	X	T	M _w	T _c	ω	b ₁	C _p	b ₂
1	-2.02446	-0.93383	4.533736	-0.44905	4.208361	2.690171	14.96542	- 16.7235
2	-2.65498	-0.82376	3.250442	-2.09916	1.266558	2.812396	-9.72214	
3	2.171901	0.910275	2.438835	9.816664	-0.93024	1.515471	13.17487	
4	-1.07399	2.535015	-0.20092	-3.16099	-0.29457	2.17979	1.144988	
5	0.028289	-5.02244	3.497867	-5.60364	-1.60507	1.114515	-0.33716	
6	1.413218	-0.45905	4.420191	-5.00281	0.394967	-2.16968	-1.56399	
7	0.550347	0.896689	-2.88682	4.013828	2.006397	-1.78026	18.6967	
8	0.260802	0.576432	0.370242	-1.43241	-0.39933	2.000853	45.43137	
9	-0.7863	-0.88243	-0.41349	4.262521	0.494902	2.837414	-4.59446	
10	-0.41106	-0.87771	-1.18471	5.229926	0.591872	-4.70259	29.6453	
11	1.837308	-313.772	-1.96508	1.119526	-0.51365	73.42368	0.365153	
12	-0.33432	-0.53812	0.928282	-1.75854	-0.32996	0.124388	32.86031	



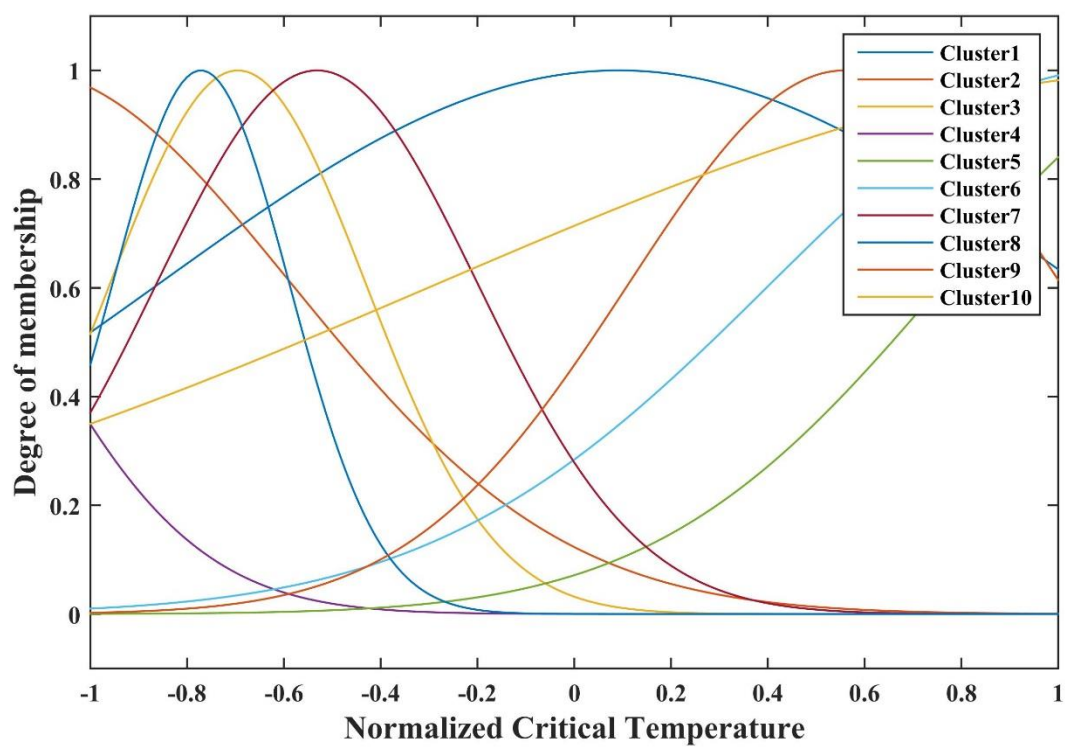
(a)



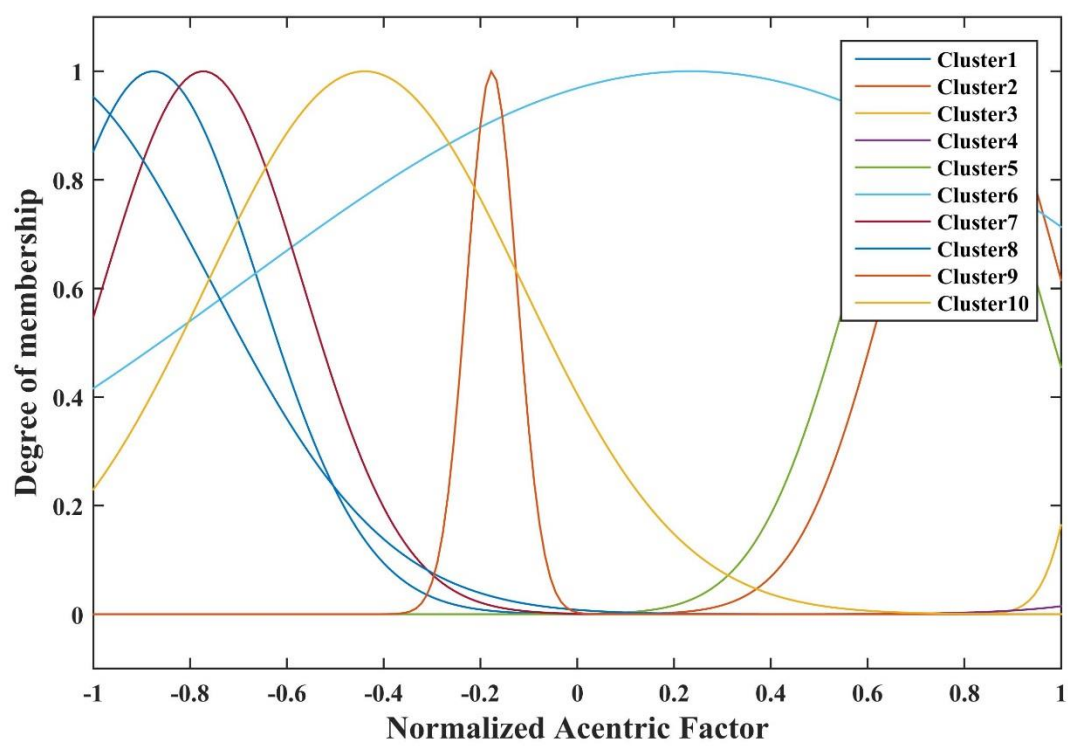
(b)



(c)

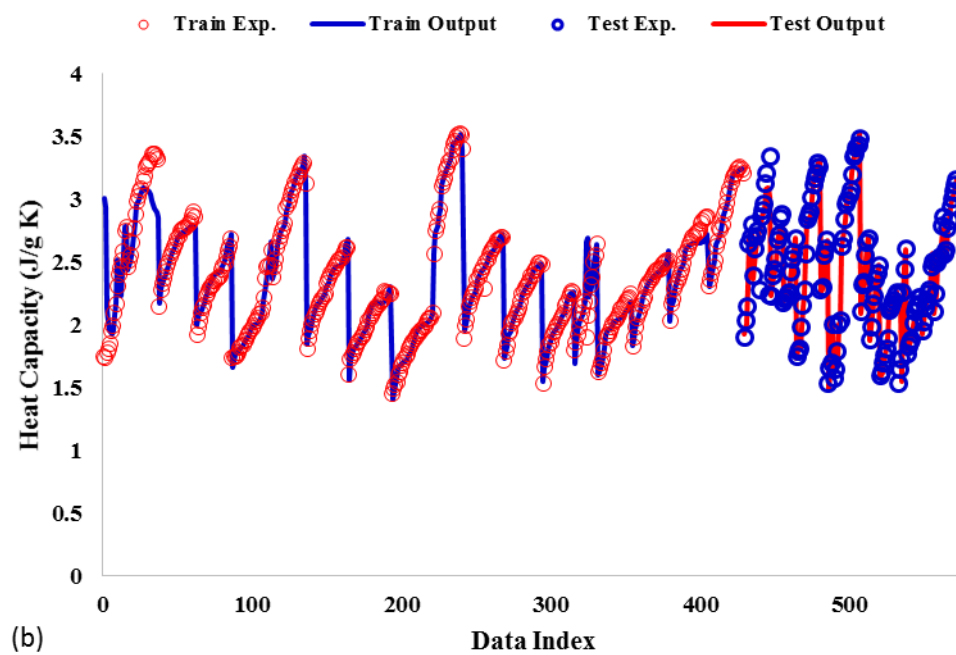
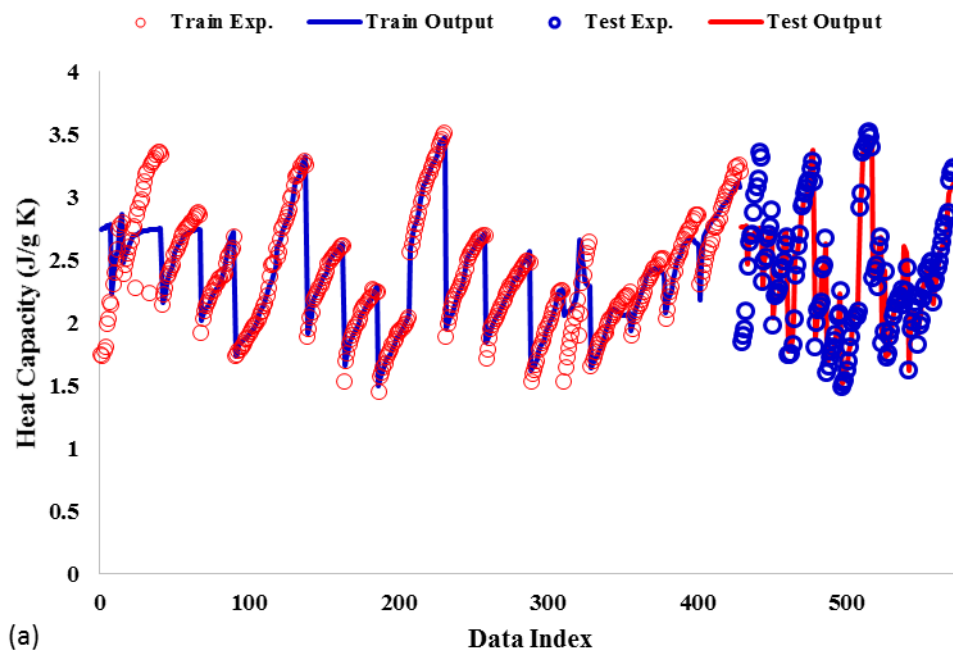


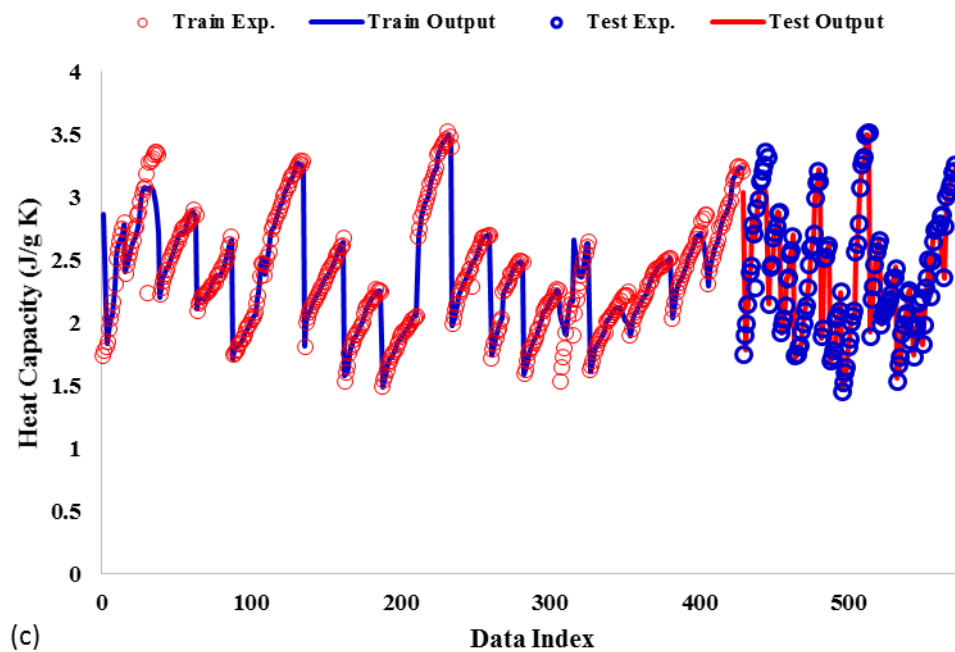
(d)



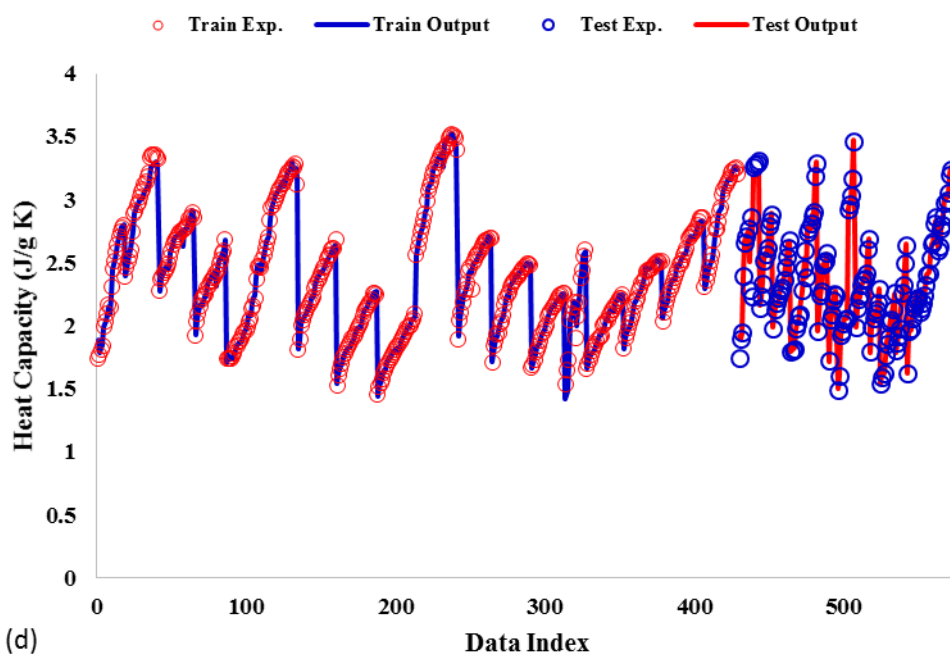
(e)

Fig. S1. The trained membership functions for different input parameters: (a) x , (b) T , (c) M_w , (d) T_c , and (e) ω .



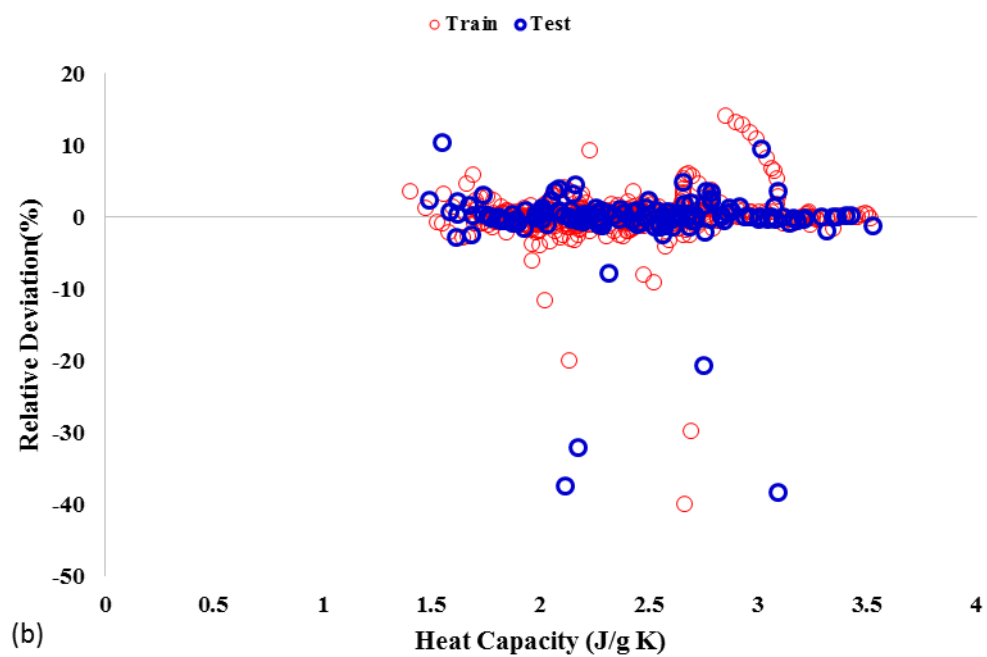
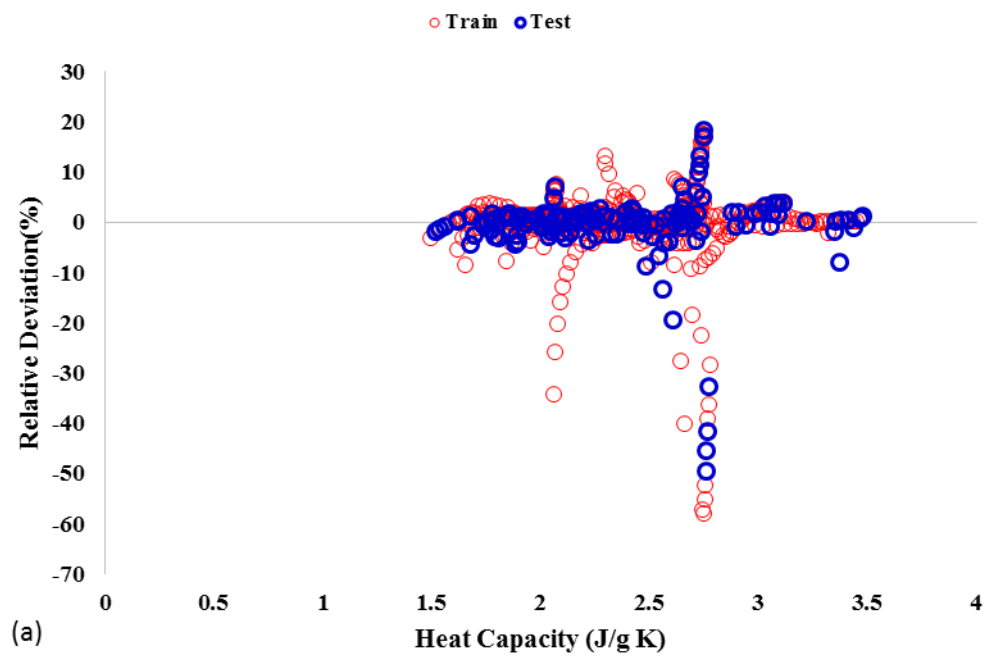


(c)



(d)

Fig. S2. Estimated CP values compared to experimental data using different models; (a) ANFIS, (b) MLP-ANN, (c) RBF-ANN, (d) SGB



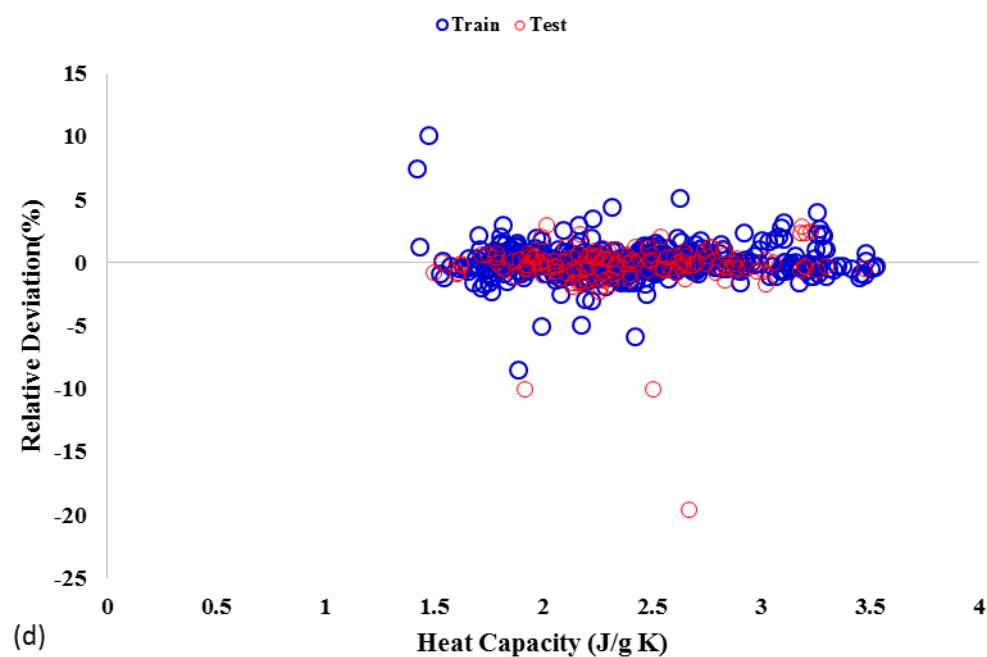
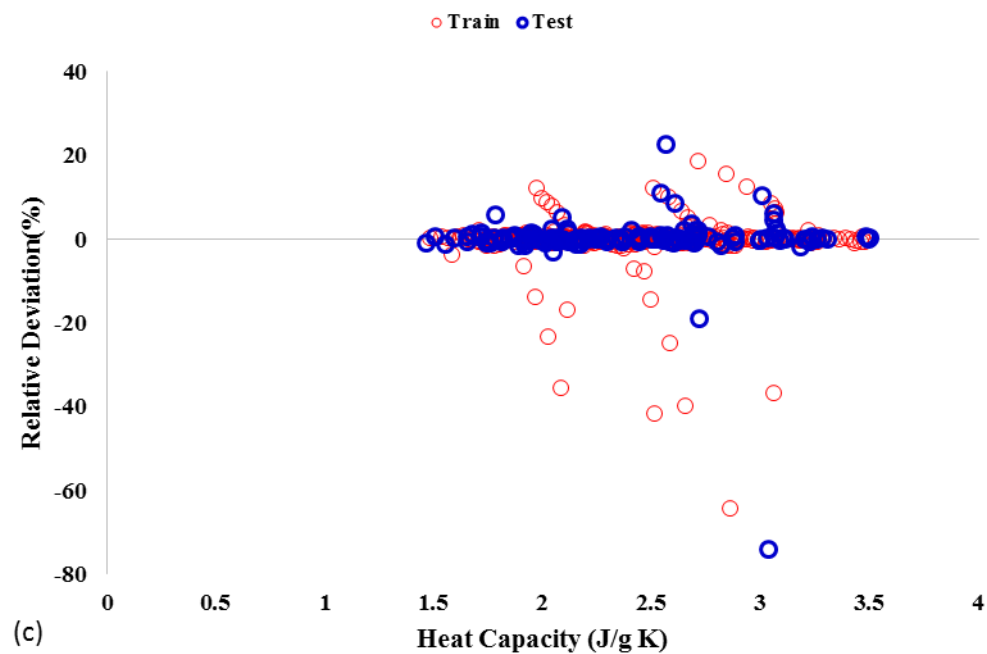


Fig. S3. Relative deviation (%) of testing and training data using different models; (a) ANFIS, (b) MLP-ANN, (c) RBF-ANN, (d) SGB.