LSNReviews

From: Miriam Juckett [mjuckett@cnwra.swri.edu]
Sent: Wednesday, February 07, 2007 4:57 PM
To: Roberto Pabalan
Subject: salt data
Attachments: Thesis_single salts.xls

Bobby-

Attached is the single salt data you were asking about. I'm working right now on finding those recipes for the multi salts and will have them to you before I leave today.

M

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Properties Page

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rpabalan@cnwra.swri.edu; Wed, 07 Feb 2007 15:56:30 -0600 (CST)
Date: Wed, 07 Feb 2007 15:56:30 -0600
From: Miriam Juckett <mjuckett@cnwra.swri.edu>
Subject: salt data
To: Roberto Pabalan <rpabalan@cnwra.swri.edu>
Reply-to: mjuckett@cnwra.swri.edu
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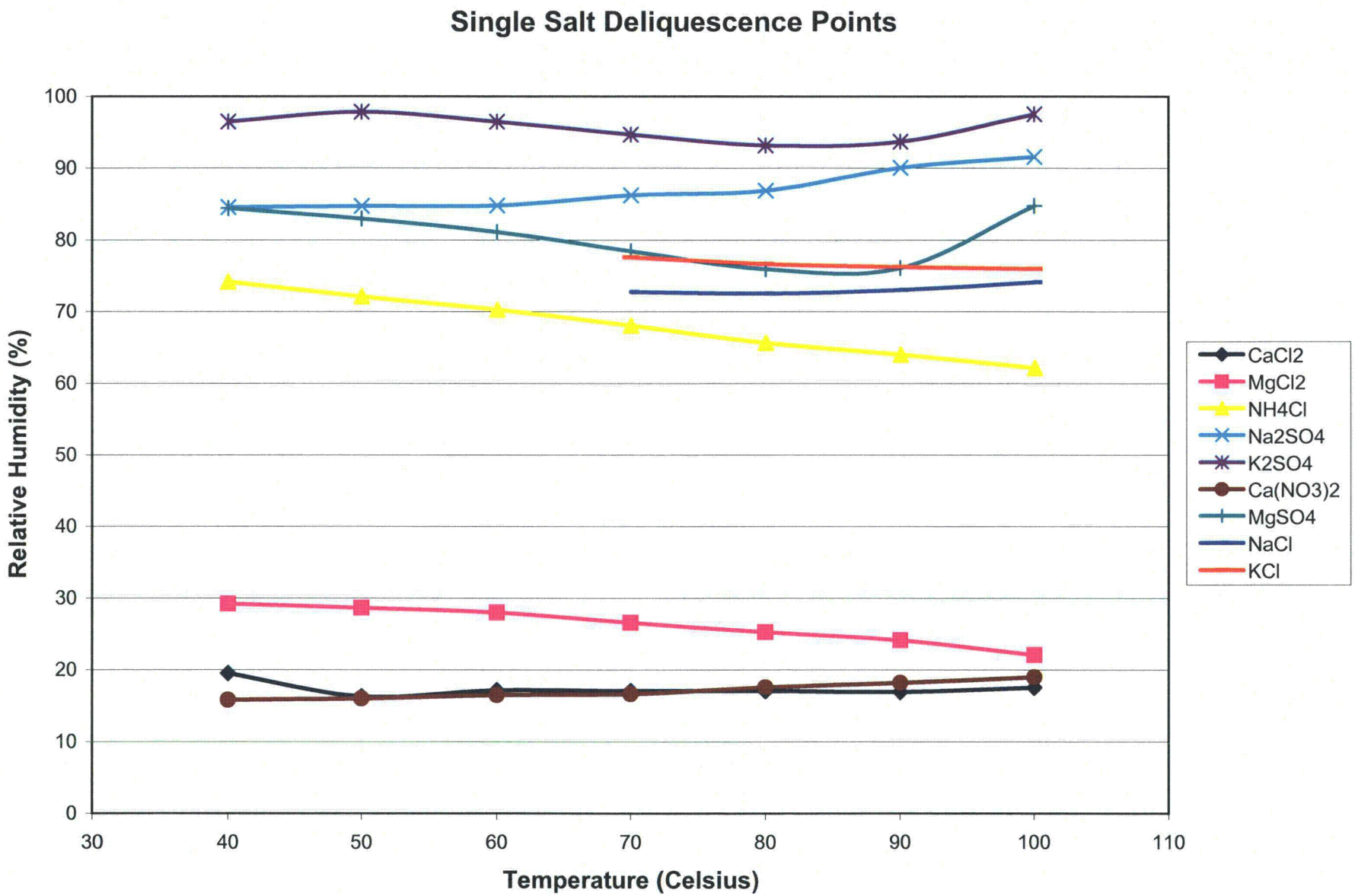
Single Salt Deliquescence Points
Relative Humidity (%)
Temperature (Celsius)
100
90
80
70
60
50
40
30
20
10
0
30
40
50
60
70
80
90
100
110
CaCl2
MgCl2
NH4Cl
Na2SO4
K2SO4
Ca(NO3)2
MgSO4
NaCl
KCl

Condensed Hygrometer Data

SET ONE

Temp/RH%	CaCl2	MgCl2	NH4Cl	Na2SO4	K2SO4	(NH4)2SO4	Ca(NO3)2	MgSO4	CaCO3
40	20.280	29.873	74.937	85.280	95.385	76.415	15.820	83.190	97.795
50	16.335	28.590	73.108	85.908	96.460	75.650	16.045	82.130	96.665
60	16.802	27.306	70.992	85.828	95.635	74.960	16.495	80.480	96.465
70	16.883	25.685	68.970	85.570	95.435	74.78	16.655	78.480	95.980
80	16.938	23.848	65.623	84.700	92.545	73.215	17.590	75.635	95.593

SET TWO

Temp/RH%	CaCl2 New	MgCl2 New	NH4Cl New	Na2SO4 New	K2SO4 New	(NH4)2SO4 New	MgSO4 New
40	18.77	28.64	73.36	83.79	97.62	75.93	85.62
50	16.26	28.74	71.14	83.51	99.26	76.69	83.78
60	17.52	28.7	69.58	83.77	97.32	74.96	81.71
70	18.19	26.32	67.13	83.85	94.01	74.78	77.6
80							

SET THREE

Temp/RH%	CaCl2	MgCl2	NH4Cl	Na2SO4	K2SO4	(NH4)2SO4	Ca(NO3)2	MgSO4	NaCl	KCl
70	16.115	27.655	68.050	89.135	94.605	78.115	16.645	79.085	72.720	77.580
80	17.190	26.680	65.640	88.990	93.795	77.710	17.565	76.200	72.510	76.650
90	16.905	24.165	63.985	90.045	93.710	77.590	18.210	76.085	73.015	76.265
100	17.540	22.075	62.110	91.550	97.505	78.525	18.975	84.730	74.090	75.995

Blue=redo

Red= substitute new data point

Temp/RH%	CaCl2	MgCl2	NH4Cl	Na2SO4	K2SO4	Ca(NO3)2	MgSO4	NaCl	KCl
40	19.525	29.257	74.148	84.535	96.503	15.820	84.405		
50	16.298	28.665	72.124	84.709	97.860	16.045	82.955		
60	17.161	28.003	70.286	84.799	96.478	16.495	81.095		
70	17.063	26.553	68.050	86.185	94.683	16.650	78.388	72.720	77.580
80	17.064	25.264	65.631	86.845	93.170	17.578	75.918	72.510	76.650
90	16.905	24.165	63.985	90.045	93.710	18.210	76.085	73.015	76.265
100	17.540	22.075	62.110	91.550	97.505	18.975	84.730	74.090	75.995

Bobby's SOLCALC Data

SUMMARY TABLE:

TEMP(C)	RH %						
	Na2SO4	Na2SO4	K2SO4	K2SO4	MgSO4	MgSO4	MgCl2
40	87.600	85.280	96.900	95.385	86.900	83.190	33.100
50	88.100	85.908	96.500	96.460	83.300	82.130	32.000
60	88.600	85.828	96.100	95.635	82.100	80.480	30.700
70	88.900	85.570	95.800	95.435	80.400	78.480	29.000
80	89.300	84.700	95.400	92.545	78.000	75.635	27.000
Probe:		77B		76B		76B	

Comparison of old and new data at 40C

Temp/RH%	**CaCl2**	**MgCl2**	**NH4Cl**	**Na2SO4**	**K2SO4**	**(NH4)2SO4**	**Ca(NO3)2**	**MgSO4**
40	20.280	29.873	74.937	85.280	95.385	76.415	15.820	83.190
40	31.390	28.640	73.360	83.790	97.620	75.930	44.610	85.620

Comparison between old method and new method:

% Difference is between old values and new values of RH measurement with the "new data" value in the denominator.

% Difference between new and calc values has calculated value in the denominator.

Values of concern are highlighted in red (over 5% difference.)

CaCl2

Temperature	Old Data	New Data	Calculated	% Difference	% Diff (new vs. calc)
40	20.28	18.77		-8.04%	
40 (decreasing)		19.60			
50	16.34	16.26	16.68	-0.46%	2.52%
50 (decreasing)		18.83			
60	16.80	17.52	16.93	4.10%	-3.48%
60 (decreasing)		17.1			
70	16.8825	18.19	17.2	7.19%	-5.76%

MgCl2

Temperature	Old Data	New Data	SolCalc Data	% Difference	% Diff (new vs. calc)
40	29.87	28.64	33.10	-4.31%	13.47%
40 (decreasing)					
50	28.59	28.74	32.00	0.52%	10.19%
50 (decreasing)		28.76			
60	27.31	28.70	30.70	4.86%	6.51%
60 (decreasing)		26.54			
70	25.685	26.32	25.69	2.41%	-2.47%

NH4Cl

Temperature	Old Data	New Data	% Difference
40	74.94	73.36	-2.15%
40 (decreasing)			
50	73.11	71.14	-2.77%
50 (decreasing)		72.12	
60	70.99	69.58	-2.03%
60 (decreasing)		69.1	
70	68.97	67.13	-2.74%

Na2SO4

Temperature	Old Data	New Data	SolCalc Data	% Difference	% Diff (new vs. calc)
40	85.28	83.79	87.60	-1.78%	4.35%
40 (decreasing)					
50	85.91	83.51	88.10	-2.87%	5.21%
50 (decreasing)		84.26			
60	85.83	83.77	88.60	-2.46%	5.45%
60 (decreasing)		84.6			
70	85.57	83.85	85.57	-2.05%	2.01%

K2SO4

Temperature	Old Data	New Data	SolCalc Data	% Difference	% Diff (new vs. calc)
40	95.39	97.62	96.90	2.29%	-0.74%
40 (decreasing)					
50	96.46	99.26	96.50	2.82%	-2.86%
50 (decreasing)		96.72			
60	95.64	97.32	96.10	1.73%	-1.27%
60 (decreasing)		98.64			
70	95.44	94.01	95.44	-1.52%	1.49%

(NH4)2SO4

Temperature	Old Data	New Data	% Difference
40	76.42	75.93	-0.64%
40 (decreasing)			
50	75.65	76.69	1.36%
50 (decreasing)		76.28	
60	74.96	74.96	0.00%
60 (decreasing)		73.87	
70	74.78	74.78	0.00%

Na2CO3

Temperature	Old Data	New Data	%Difference
40	75.47	75.89	0.56%
40 (decreasing)			
50	76.73	77.04	0.41%
50 (decreasing)		77.78	
60	77.70	78.03	0.43%
60 (decreasing)		77.20	
70	77.65	77.65	0.00%

KHCO3

Temperature	Old Data	New Data	%Difference
40	67.51	84.54	20.14%
40 (decreasing)		84.33	
50	66.18	82.94	20.21%
50 (decreasing)		81.85	
60	64.58	79.72	18.99%
60 (decreasing)		79.50	
70	74.825	75.66	1.10%

NaHCO3

Temperature	Old Data	New Data	%Difference
40	86.93	90.88	4.35%
40 (decreasing)		90.32	
50	86.08	90.46	4.84%
50 (decreasing)		90.01	
60	85.32	93.40	8.66%
60 (decreasing)		90.84	

70	88.545	87.16	-1.59%	

	MgSO4				
Temperature	Old Data	New Data	SolCalc Data	% Difference	% Diff (new vs. calc)
40	83.19	85.62	86.90	2.84%	1.47%
40 (decreasing)					
50	82.13	83.78	83.30	1.97%	-0.58%
50 (decreasing)		79.14			
60	80.48	81.71	82.10	1.51%	0.48%
60 (decreasing)		80.39			
70	78.48	77.6	78.48	-1.13%	1.12%