

Document Title: Description, AN, Temperature dependence of the Aw of Saturated Salt solutions		Part # and Rev. 13463-00	
		Release Date:	
Rev.	Description	Revision By	Date

Production Filename: 13463 (In Product Library)

Path to Working Files: DecaDoc\Application Notes\Master

Dimensions: 8.5 inch wide, 11 inch tall

Material: Paper, 92 Bright White or better, 75g/m² or heavier

Colors: Color Print on White

Printer: HP Color LaserJet 8550-PS

Finish: None

Adhesive: None

Special Notes: Illustrations are Ref Only ** Not to Scale ** (Shown page 1 of 2)



Application Note

Temperature Dependence of the Water Activity of Saturated Salt Solutions

The relationship between water activity (a_w) and temperature of saturated salt solutions generally follows the following empirical model:

$$\ln(a_w) = k_1/T - k_2$$

where:

k_1 and k_2 are constants, different for each salt
T is temperature in Kelvin

Constants k_1 and k_2 may be calculated by regression analysis of experimental data. The following table gives the values for a range of salts based on experimental data previously published by Dr. Labuzs.

Salt	k_1	k_2	Mean Relative % Error
K ₂ C ₂ H ₂ O ₄	333.9001	2.6185	1.1647
K ₂ CO ₃	-3.0240	0.8300	0.0046
K ₂ SO ₄	192.0886	0.7183	0.6177
K ₂ SO ₄	27.7544	0.2066	0.0723
KBr	171.2747	0.7828	0.3117
KCl	157.0587	0.6967	0.0289
KI	238.1542	1.2588	0.0092
KOH	2094.4890	9.4977	1.8022
LiBr	620.6338	4.8327	0.1734
LiCl	10.8233	2.2193	0.3246
LiI	982.7329	3.0477	0.9218
Mg(NO ₃) ₂	84.6993	2.2670	0.3413
MgCl ₂	151.0652	1.6271	0.4059
(NH ₄) ₂ SO ₄	76.8191	0.4690	0.0337
NaBr	447.8054	2.0575	0.3189
NaCl	23.1092	0.3607	0.1631
NaI	643.0114	3.1467	1.4864
NaNO ₃	253.3800	1.1493	0.1487
ZnBr ₂	409.6257	3.9139	1.3005