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EXPERIMENT - 7

AIM:

To determine the mass susceptibility of anhydrous Manganese Sulphate($MnSO_4.H_2O$) by Quinck's tube.

Observations:

Molarity = 1.00 M
Molar Mass of $MnSO_4.H_2O$ = 169 g/mol

Table 1:

S. no.	Current (A)	Magnetic Field (KG)
01.	0.5	0.113
02.	1.0	0.227
03.	1.5	0.340
04.	2.0	0.453
05.	2.5	0.567
06.	3.0	0.680
07.	3.5	0.793
08.	4.0	0.907
09.	4.5	1.020
10.	5.0	1.133

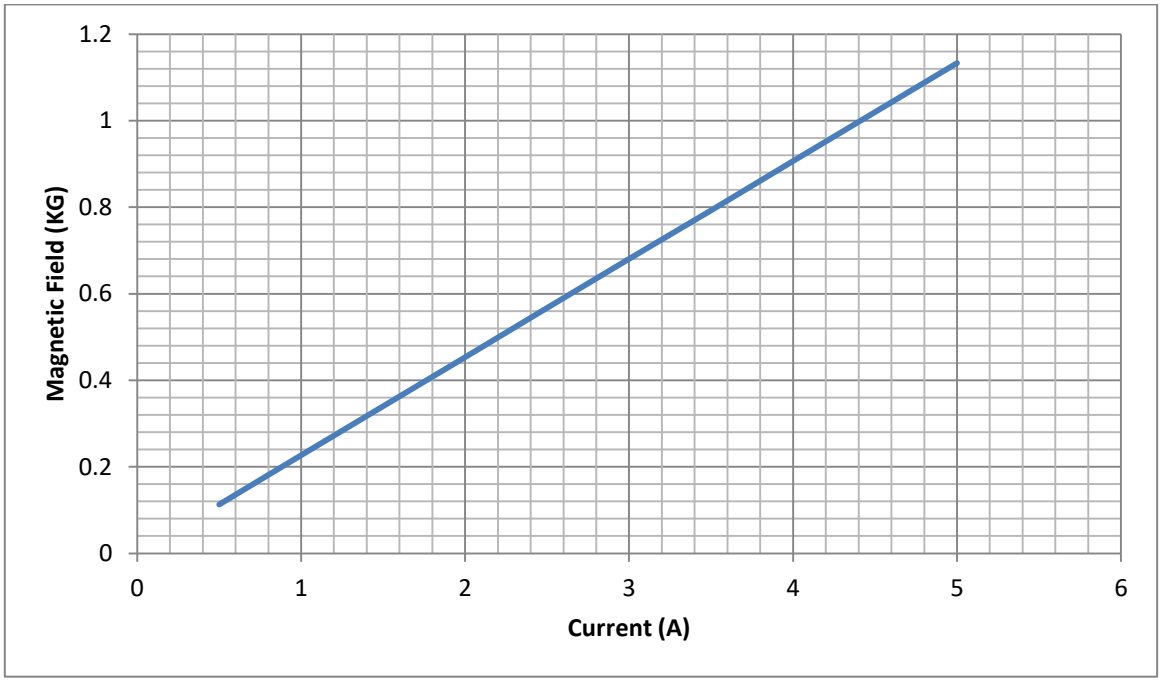
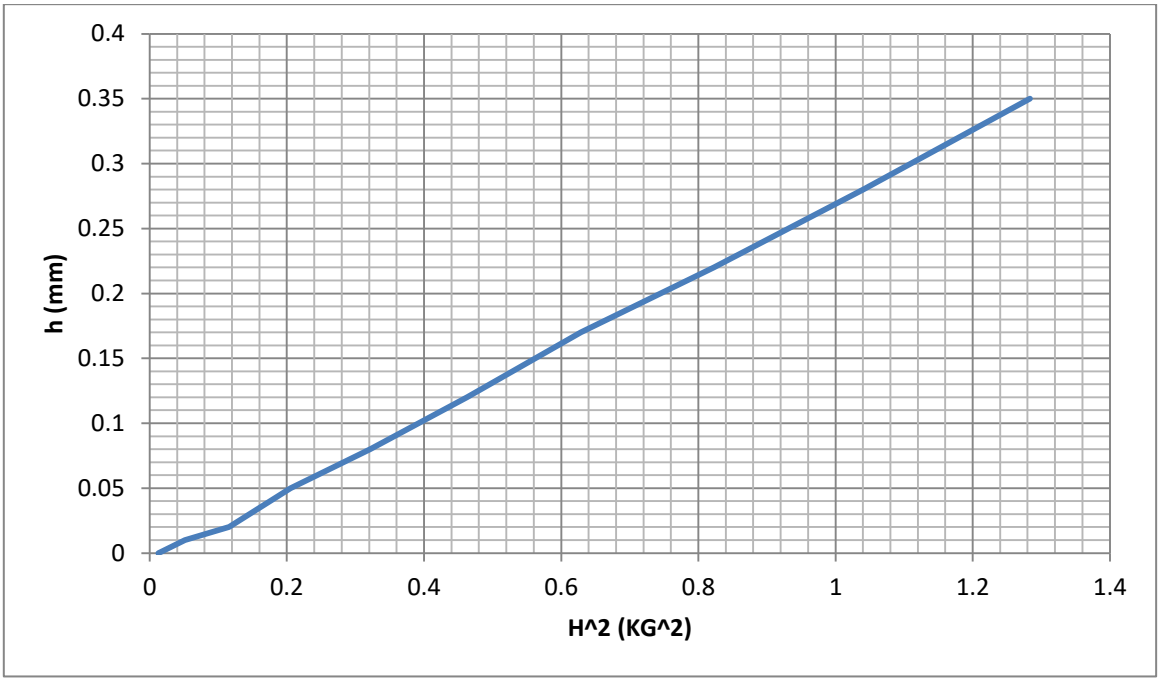


Table 2:

S. no.	Magnetic Field, H (KG)	H^2	Height of liquid Level (mm)	Rise of solution, h (mm)
01.	0.113	0.012769	12.875	0.00
02.	0.227	0.051529	12.885	0.01
03.	0.340	0.115600	12.895	0.02
04.	0.453	0.205209	12.925	0.05
05.	0.567	0.321489	12.955	0.08
06.	0.680	0.462400	12.995	0.12
07.	0.793	0.628849	13.045	0.17
08.	0.907	0.822649	13.095	0.22
09.	1.020	1.040400	13.155	0.28
10.	1.133	1.283689	13.225	0.35



Calculations:

Slope, m = $\frac{0.3-0.2}{1.12-0.76} X\ 10^{-7} = 0.278\ X\ 10^{-7} cm\ G^{-2}$

Density, ρ = 0.169 g cm^{-3}

Acceleration due to gravity, g = 981 cm s^{-2}

Susceptibility of $MnSO_4.H_2O$, $X_{MnSO_4} = 2\ X\ 981\ X\ 0.169\ X\ 0.0278\ X\ 10^{-6}$

$$X_{MnSO_4} = 9.2178684\ X\ 10^{-6}$$

Actual Value of susceptibility, $X_o = 9.21\ X\ 10^{-6}$

Percentage Error, $e = \frac{9.2178684-9.21}{9.21} X\ 100 = 0.08543322\%$

Results:

Mass susceptibility of anhydrous Manganese Sulphate($MnSO_4.H_2O$) by Quinck's tube method is 9.2178684 $X\ 10^{-6}$ with percentage error of 0.08543322%.