Module 6

Data for Module 6a: Magnetic properties of nickel

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Understanding Magnetic Behavior of Materials (Exp. No.12)** | | | | | | | | | |  |
|  |
| **Nickel (Ni) CH(X) - 1.0, CH(Y) - 0.1** | | | | | | | | | |  |
|  |
| **Mag. Field** | **Loop Width (X-intercept)** | | **Y- Intercept** | | **Tip to Tip Distance** | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| **G** | **Div.** | **mm** | **Div.** | **mV** | **Div.** | **mV** |  | **G** | **mm** |  |
| 31 | 2 | 4 | 6 | 120 | 10 | 200 |  | 31 | 4 |  |
| 65 | 4 | 8 | 8 | 160 | 14 | 280 |  | 65 | 8 |  |
| 106 | 5 | 10 | 10 | 200 | 18 | 360 |  | 106 | 10 |  |
| 150 | 6 | 12 | 12 | 240 | 20 | 400 |  | 150 | 12 |  |
| 195 | 8 | 16 | 13 | 260 | 21 | 420 |  | 195 | 16 |  |
| 245 | 10 | 20 | 14 | 280 | 22 | 440 |  | 245 | 20 |  |
| 294 | 11 | 22 | 15 | 300 | 23 | 460 |  | 294 | 22 |  |
| 341 | 12 | 24 | 16 | 320 | 23 | 460 |  | 341 | 24 |  |
| 383 | 14 | 28 | 16 | 320 | 23 | 460 |  | 383 | 28 |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  | | | | | | | | |  |  |
| **Iron(Fe) CH(X) - 1.0, CH(Y) - 0.1** | | | | | | | |  |  |  |
| **Mag. Field** | **Loop Width (X-intercept)** | | **Y- Intercept** | | **Tip to Tip Distance** | |  |  |  |  |
|  |  |  |  |  |  | **G** | **mm** |  |
| **G** | **Div.** | **mm** | **Div.** | **mV** | **Div.** | **mV** |  |  |  |  |
| 31 | 3 | 6 | 9 | 180 | 14 | 280 |  | 31 | 6 |  |
| 65 | 4 | 8 | 13 | 260 | 18 | 360 |  | 65 | 8 |  |
| 105 | 6 | 12 | 14 | 280 | 20 | 400 |  | 105 | 12 |  |
| 150 | 7 | 14 | 16 | 320 | 21 | 420 |  | 150 | 14 |  |
| 194 | 8 | 16 | 17 | 340 | 22 | 440 |  | 194 | 16 |  |
| 244 | 10 | 20 | 18 | 360 | 22 | 440 |  | 244 | 20 |  |
| 292 | 12 | 24 | 18 | 360 | 23 | 460 |  | 292 | 24 |  |
| 340 | 13 | 26 | 19 | 380 | 23 | 460 |  | 340 | 26 |  |
| 380 | 14 | 28 | 19 | 380 | 23 | 460 |  | 380 | 28 |  |
|  |  |  |  |  |  |  |  |  |  |  |

Data for Module 6b Hall Effect

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Part A |  |  |  |  |  |  |
|  | **Table for Correction factor By using Woder** | | **by susing** | **vonder pauw method** | |  |  |  |
| Rvertical | I(MA) | V(MV) | R(ohm) | Rhorizontal | I(MA) | V(MV) | R(ohm) |  |
| R1234 | 1.3 | 12.9 | 9.92 | R2341 | 1.3 | 93.4 | 71.84 |  |
| R3412 | 1.3 | 12.2 | 9.38 | R4123 | 1.3 | 91.5 | 70.38 |  |
| R2143 | 1.3 | 12.8 | 9.84 | R3414 | 1.3 | 92.3 | 71 |  |
| R4321 | 1.3 | 12.4 | 8.53 | R1432 | 1.3 | 92.7 | 7130 |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | Data for Hall Measurment | | |  |  |  |  |  |
| **I(A)** | **H (Gauss)** | H-e (e=94 ) | **VH(mv) Hall voltage** | **Hall voltage VH(mv) opposite** |  |  |  |  |
| 0 | 94 | 0 | 105.5 | 102.9 |  |  |  |  |
| 0.25 | 368 | 274 | 107.8 | 100.4 |  |  |  |  |
| 0.5 | 647 | 553 | 110.6 | 97.9 |  |  |  |  |
| 0.75 | 912 | 818 | 113.4 | 95 |  |  |  |  |
| 1 | 1206 | 1112 | 115.9 | 92.8 |  |  |  |  |
| 1.5 | 1890 | 1796 | 122.5 | 88.2 |  |  |  |  |
| 2 | 2430 | 2336 | 127.3 | 84.1 |  |  |  |  |
| 2.5 | 2980 | 2886 | 132.2 | 81.3 |  |  |  |  |
| 3 | 3500 | 3406 | 136.7 | 78.3 |  |  |  |  |
| 3.5 | 4030 | 3936 | 140.9 | 76 |  |  |  |  |
| 4 | 4500 | 4406 | 144.4 | 73.8 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Sample Diamention | | Ge Sample | L =6.5mm |  |  |  |  |  |
|  |  |  | W=4.75 |  |  |  |  |  |
|  |  |  | t=0.4 |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | **Part B** |  |  |  |  |  |  |  |
| Sample Germanium | |  |  |  |  |  |  |  |
| Constant Current 3MA | |  |  |  |  |  |  |  |
| Sample thichkness | | 0.5mm |  |  |  |  |  |  |
| Temp.(K) | Voltage MV |  |  |  |  |  |  |  |
| 303 | 45.5 |  |  |  |  |  |  |  |
| 313 | 38.3 |  |  |  |  |  |  |  |
| 323 | 30.3 |  |  |  |  |  |  |  |
| 333 | 22.6 |  |  |  |  |  |  |  |
| 343 | 16.8 |  |  |  |  |  |  |  |
| 353 | 12.2 |  |  |  |  |  |  |  |
| 363 | 9 |  |  |  |  |  |  |  |
| 373 | 6.7 |  |  |  |  |  |  |  |
| 383 | 5 |  |  |  |  |  |  |  |
| 393 | 3.7 |  |  |  |  |  |  |  |
| 403 | 2.8 |  |  |  |  |  |  |  |
| 413 | 2.2 |  |  |  |  |  |  |  |
| 423 | 1.7 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |