



## MAGNETIC SUSCEPTIBILITIES IN WEAK FIELDS\*

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Specimens of three pure diamagnetic elements and three pure paramagnetic salts were investigated by measuring the force on a spherical specimen when it was placed in an axially symmetrical field whose strength, and space rate of change of strength along the axis of symmetry, could be calculated. The forces varied from 6 to  $25 \times 10^{-6}$  dyne and the sensitivity of the apparatus was  $10^{-6}$  dyne/mm deflection at a scale distance of 317 cm. The small deflections were reproducible to within 6 per cent, the large to within 1 per cent. The necessary variation of the field over the specimen was less than 5 per cent of the mean value of the field

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strength. The observed variations were greater than the experimental errors. At 1 oersted  $\text{FeCl}_2$  had a susceptibility of 159.

| Substance  | Volume of Substance (cm <sup>3</sup> ) | Volume Susceptibility (e. m. u.) |        |       | Int. Crit. Tab. |
|--|--|----------------------------------|--------|-------|-----------------|
|  |  | H=2.5                            | H=5    | H=10  |                 |
| Bismuth .....  | 1.32                                   | -10.9                            | -11.2  | -10.7 | -13.78          |
| Antimony .....   | 1.55                                   | -4.45                            | -3.89  | -3.10 | -5.75           |
| Cadmium .....  | 1.59                                   | —                                | -0.895 | -0.63 | -1.56           |
| Bismuth (Powder) .....                                       | 0.992                                  | -9.78                            | -7.65  | -7.13 | —               |
| (Powders)  |  | H=2                              | H=3    | H=5   |                 |
| $\text{FeCl}_2$ .....  | 0.43                                   | 153.                             | 148.   | 140.  | 240.            |
| $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ .....              | 0.505                                  | 78.5                             | 77.7   | 75.   | 79.             |
| $\text{Co}_2(\text{SO}_4)_3 \cdot 7\text{H}_2\text{O}$ ..... | 0.435                                  | 69.5                             | 79.8   | 75.   | 72.5            |

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