4·2. *The pressure coefficient of the ideal electrical resistivity*

4·2·1. *The temperature dependence*

From our measurements on the pressure and temperature coefficients of electrical resistivity, we can deduce $\partial \ln \rho_i / \partial \ln V$ and $\partial \ln \rho_i / \partial \ln T$ at a fixed density for the metals potassium, sodium and lithium.[†] We can thus test whether $\partial \ln \rho_i / \partial \ln V$ is linearly related to $(1 + \partial \ln \rho_i / \partial \ln T)$ for these metals (cf. equation (2)). This is done in figures 4 and 5. The resulting curves are all representable by straight lines although in potassium, for which our measurements are most accurate, there are several points which lie further from the line than our estimated experimental error.
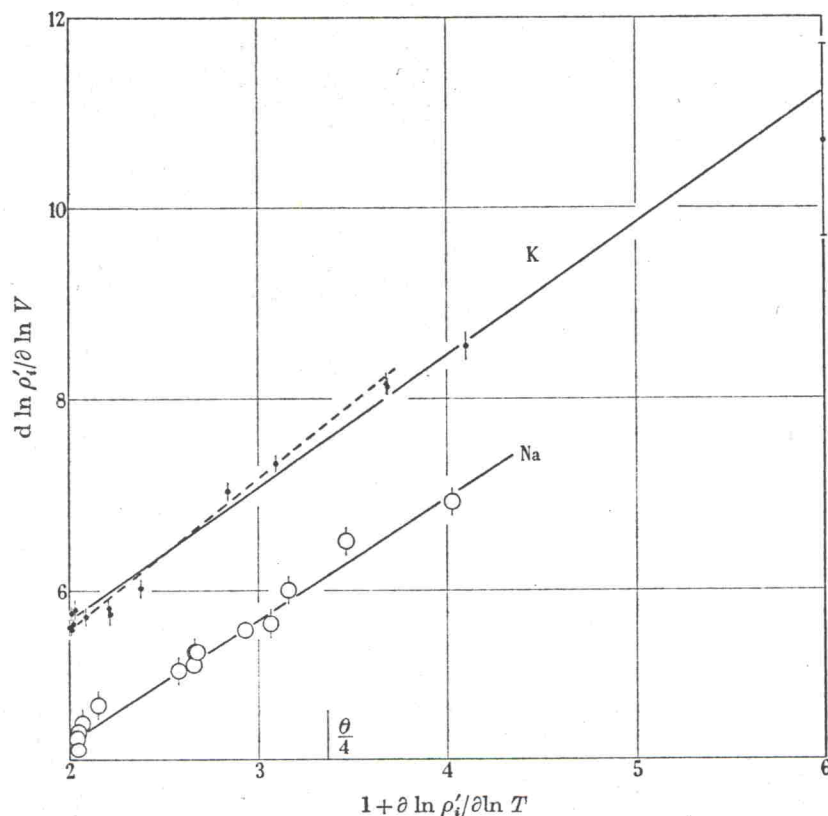

FIGURE 4. The volume coefficient of the ideal resistivity compared with the temperature coefficient of the ideal resistivity of sodium (b.c.c. phase) and potassium; – – –, line drawn through points corresponding to temperatures above $\theta/4$ in potassium.

Since equation (2) is valid to a good approximation, we can determine the values of $\gamma_R (= -\mathrm{d} \ln \theta_R / \mathrm{d} \ln V)$ and $\mathrm{d} \ln K / \mathrm{d} \ln V$ from the experimental data on lithium, sodium, potassium and copper (the data on copper were taken from our earlier measurements (Dugdale & Gugan 1957)). These values are listed in table 12 in which we also include values of γ_G defined by the Grüneisen relation given in equation

† As explained above, the results for lithium have not been corrected to a fixed density since the corrections are small and probably less than our experimental error.