ature) and K(y) is given by

$$K\ (y) = \frac{3}{y^3} \int_0^y \frac{y^3 dy}{e^y - 1} \tag{10}$$

TABLE III. Debye Temperatures Used to Calculate C_v^l [9]

Rare Earth	Debye Temperature[a] (°K)
γ-Ce	138
Pr	138
Nd	148
Sm	148
Eu	121[b]
Gd	155
Tb	158
Dy	158
Ho	161
Er	163
Tm	167

a. Based on specific heat data taken from about 15° to 300°K.
b. Calculated by ref. [9] from Lindemann equation.

The integral in Eqn. (10) has been solved, and tables of C_v^l vs θ/T may be found in a number of sources* (of these, we have used the tables of Lewis et al. [16a] to determine C_v^l at 300°K). The Debye temperature used to calculate C_v^l are listed in Table III.

After these three contributions to specific heat were calculated, they were added together and subtracted from C_p to give C_v^e . The values for the various contributions to the specific heat are summarized in Table IV along with the resultant C_v^e term and the electronic specific heat constant, γ.

* Some of these sources are listed in the compilation by Gschneidner. [9].

TABLE IV. The Calculated C_v^l, C_v^f and C^d and Contributions to the Specific Heat, the Measure C_p Values, and Resultant C_v^e and γ Values (all values in cal/g-at. deg. units, except for γ values which are in cal/g-at. deg.^{2} units)

Rare Earth	C_v^l	C_v^f	C^d	C_p	C_v^e	$\gamma \times 10^4$
γ-Ce	5.898	0.010	0.023	6.47[a]	0.539	18.0
Pr	5.898	0.010	0.019	6.45[b]	0.523	17.4
Nd	5.889	0.020	0.043	6.55[a]	0.616	20.5
Sm	5.889	0.460	0.039	6.80[a]	0.826	27.5
Eu	5.913	-	0.302	6.48[b]	0.265	8.83
Gd	5.882	-	0.019	6.561[c]	0.660	22.0
Tb	5.879	0.010	0.051	6.812[d]	0.872	29.1
Dy	5.879	-	0.045	6.577[e]	0.653	21.8
Ho	5.875	-	0.055	6.498[f]	0.568	18.9
Er	5.873	-	0.073	6.718[g]	0.772	25.7
Tm	5.866	-	0.082	6.460[h]	0.512	17.1

a. After Spedding, McKeown and Daane, [17].
b. After Berg, Spedding and Daane, [18].
c. After Dennison, [19].
d. Because of a small magnetic contribution to C_p at 300°K, the C_p values at 320°, 340° and 360°K given by Jennings, Stanton and Spedding [20] were extrapolated to 300°K to give this value.
e. Mean value from data of Dennison [19] and Griffel, Skochdapole and Spedding (ref. 21).
f. After Gerstein, et al, [22].
g. After Skochdopole, Griffel and Spedding, [23].
h. After Jennings, Hill and Spedding, [24].

The mean value of γ for the ten trivalent metals is 21.8 which is in reasonable agreement with the low temperature values of lanthanum and lutetium (24.1 and 24.4, respectively). Although the values in Table IV vary from 17.1 to 29.1 they should be considered to be approximately constant in view of the assumptions involved in this calculation. These results indicate that the large values of γ obtained from low temperature specific heat measurements for praseodymium, neodymium, holmium, thulium and probably erbium are incorrect and should be substantially lower. The γ values given in Table IV also support a band model which consists of overlapping 6s and 5d bands containing three electrons and the absence of an overlapping 4f band.

The γ value calculated by this technique for europium is in reasonable agreement with that of ytterbium, (see Table I) considering the Debye temperature used in the calculations was obtained from the Lindemann relationship. The γ value for europium, however, is approximately 50 per cent smaller than the value obtained from very low temperature specific