On An Error in Specific Heat Values for Sodium-Potassium Alloys

In connection with the increased interest displayed in the recent period with respect to questions involving the use of liquid metals as coolant media, a knowledge of the properties of liquid metals has acquired great significance. It is therefore natural that the properties of liquid metals and, in particular, of sodium-potassium alloys, have been included by authors in handbooks and reference works. In the books entitled "Thermal Physical Properties of Materials,"* edited by N. B. Vargaftik and "High Temperature Coolants"*** by A. V. Chechetkin, the properties of sodium-potassium alloys taken over from Lyon's "Liquid Metals Handbook" have been entered [1].

However, in the first edition of the Handbook, a misprint crept into the table giving the properties of liquid metals: the properties of the alloy consisting of 22% Na and 78% K were attributed to the alloy consisting of 56% Na and 44% K, and vice versa. This fact may be easily corroborated by comparing the melting points, specific weights, and other properties of the sodium-potassium alloys given in other works [2-4]. The misprint, corrected in the 2nd and 3rd editions of the "Liquid Metals Handbook," remains uncorrected in the books of N.B. Vargaftik and A. V. Chechetkin. While only the table with the error is reproduced in the "Thermal Physical Properties of Materials," A. V. Chechetkin's work offers an incorrect conclusion as to the divergence between the empirical and design data, attributing it to an additive law applicable to the specific heat of sodium-potassium alloys (p. 141). The design values for the specific heat of sodium-potassium alloys obtained additively coincide with the experimental values, which confirms the validity of that law for the specific heat of alkali metal alloys as well. In conclusion, we present here a table compiled on the basis of the data contained in [4] and [5]:

Specific Heat of Sodium, Potassium, and Their Alloys

T, °C	Na	K	22% Na, 78% K (calculated)	22% Na, 78% K (experimental)	56% Na, 44% K (calculated)	56% Na, 44% K (experimental)
100	0,320	0,194	0,224	0,225	0,269	0,269
200	0,320	0,189	0,218	0,217	0,262	0,261
300	0,312	0,185	0,213	0,212	0,256	0,255
400	0,306	0,183	0,210	0,210	0,252	0,251
500	0,302	0,182	0,208	0,209	0,249	0,249
600	0,300	0,183	0,209	0,209	0,248	0,248
700	0,300	0,185	0,210	0,211	0,249	0,250
800	0,303	0,188	0,213	0,213	0,252	0,253

LITERATURE CITED

- [1] Liquid Metals Handbook (edited by R. Lyon, 1st ed.) (Washington, 1950).
- [2] Liquid Metals Handbook (edited by R. Lyon, 2nd ed.) (1952).
- [3] Liquid Metals Handbook (edited by Jackson, 3rd ed.) (1955).
- [4] D. C. Ginnings et al., J. Res. Nat. Bur. Standards 45, 1, 23 (1950).
- [5] T. B. Douglas et al., J. Am. Chem. Soc. 74, 10, 2472 (1952).

P.L. Kirillov and M.F. Troianov

* Thermal Physical Properties of Materials. Handbook edited by Prof. N. B. Vargaftik. (Gosenergoizdat, Moscow-Leningrad, 1956) p. 367.

*** A. V. Chechetkin, High Temperature Coolants (Gosenergoizdat, Moscow-Leningrad, 1957) p. 168.