American Mineralogist, Volume 64, page 925, 1979

A solution calorimetric investigation of K–Na mixing in a sanidine–analbite ion-exchange series: corrections

GUY L. HOVIS

Department of Geology, Lafayette College
Easton, Pennsylvania 18042

It has been pointed out to me (Navrotsky, personal communication) that the $W_{E,Or}$ and $W_{E,Ab}$ values for the low albite–microcline ion-exchange series of Waldbaum and Robie (1971) were interchanged in Table 2 of a paper by Hovis and Waldbaum (1977, p. 685). Thus, based on a cubic fit to the calorimetric data, $W_{E,Or}$ and $W_{E,Ab}$ values for the Waldbaum and Robie series are 8.457 (±0.099) and 5.928 (±0.085) kcal/mol, respectively. This affects observations (2) and (3) of Hovis and Waldbaum (1977, bottom p. 684, top p. 685). Based on asymmetric least-squares fits to heat-of-solution data, $W_{H,Ab} > W_{H,Or}$ (and $W_{E,Ab} > W_{E,Or}$) for the analbite–sanidine series *only*, whereas the opposite asymmetry is observed in the low albite–microcline series.

The difference in asymmetry between the low albite–microcline and analbite–sanidine series can be interpreted in one of at least two ways: (1) that the asymmetry changes with state of Al–Si ordering, or (2) that nothing better than symmetric fits to the heat-of-solution data is warranted for either series. If the first interpretation is accepted, the observed asymmetry in the enthalpy of mixing for the analbite–sanidine series can be explained in terms of strain created by the substitution of ions of unequal size into the "M" crystallographic position of these feldspars, the larger potassium ion creating the greater strain (see discussion in the previous paper, p. 685). Obviously, however, this argument could not explain the opposite asymmetry for the low albite–microcline series. At this time it is probably better to accept the second interpretation above, especially in view of the fact that the statistical differences between symmetric and asymmetric fits to the heat-of-solution data are very small for both the low albite–microcline and analbite–sanidine series. While alkali feldspar series may in fact possess asymmetric heats of mixing, they are not so grossly asymmetric that the sense of asymmetry is easily detected, as shown by the similarity of Figures 2a and 2b of the previous paper (p. 684), also by Figure 6 of Waldbaum and Robie (1971).

Acknowledgments

I am grateful to Dr. Alexandra Navrotsky for calling my attention to the error in Table 2 of Hovis and Waldbaum (1977).

References

Hovis, G. L. and D. R. Waldbaum (1977) A solution calorimetric investigation of K–Na mixing in a sanidine–analbite ion-exchange series. *Am. Mineral., 62,* 680–686.

Waldbaum, D. R. and R. A. Robie (1971) Calorimetric investigation of Na–K mixing and polymorphism in the alkali feldspars. *Z. Kristallogr., 134,* 381–420.

Manuscript received, January 22, 1979;
accepted for publication, February 26, 1979.

0003–004X/79/0708–0925$02.00