Regular variation of trace elements with SiO_2 is demonstrated with the exception of Zn, which may well be spurious owing to contamination in the low-silica rocks. Limited data compiled by Ewart (1979) from the bimodal volcanic associations in southern Queensland indicate Zn at 145 ppm and Hf at 10 ppm for the rhyolites at 76 weight percent SiO_2, which is comparable to the Wichitas.

Figure 16 presents chondrite normalized rare-earth data for the Mount Scott Granite and rhyolite dikes which cut Wichita granites. The behavior of the plots, particularly with the heavier rare earths, indicates that some of the values such as Er and Tm may have low precision (G. N. Hanson, 1980). The Mount Scott data are averages of three samples, the dikes, two; but each sample of a type had practically identical patterns. Several significant trends are observed:

1. Mount Scott granite and the dikes have similar overall patterns.
2. A distinct, negative Eu anomaly exists, indicating for the source materials: (a) medium- to low-oxygen fugacities, and (b) abundant plagioclase.
3. The absolute concentration of REE appears to be fairly high.
4. The pattern is relatively enriched in light elements and depleted in heavy rare earths, and resembles those taken from liquids equilibrated with hornblende (G. N. Hanson, 1980).

Finally, Arth (1979) noted that absolute abundance of Yb varies with Al_2O_3 for trondhjemites (a class of low-K tonalites). Only the low-Al_2O_3 group has Yb greater than 1–2 ppm, and these are "oceanic" suites, whereas the granite and rhyolite analyzed here have 7 to 9 ppm. Ewart (1979) listed 5 to 9 ppm Yb for the Queensland rhyolites, a bimodal association. Such comparisons, if nothing else, show the inappropriateness of a calc-alkaline label for the Wichita province silicic rocks (see Hanson and Al-Shaieb, 1980).

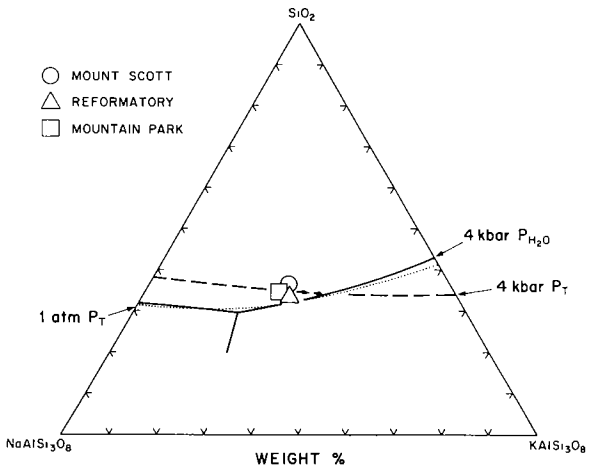

Figure 14. Position of the three chemical classes of Wichita granites in system SiO_2 (Qtz)–$NaAlSi_3O_8$ (Ab)–$KAlSi_3O_8$ (Or), with locations of boundary curves shown from Steiner and others (1975).

TABLE 9.—CHARACTERISTICS OF A-TYPE GRANITES

Index	*Wichita Granite Group*
Low CaO	<0.5; <1.5 wt% (2 sets)
Low Al_2O_3	11.6-13.0 wt%
High Fe/(Fe + Mg)	.92 - .98 (by wt.)
High K_2O/Na_2O	1.1-1.5 (by wt.)
High K_2O	4.2-5.3 wt%
Generally low f_{H_2O}	estimated $\leq$ 1 wt% H_2O in magma
High HF/H_2O	F-bearing alkali amphiboles
Enriched incompatible trace elements (REE, except Eu; Zr, Nb, Ta)	negative Eu-anomaly: Zircon-rich pegmatites; Zr, .03 wt%
Low in mafic trace elements (Co; Sc; Cr; Ni)	Co, Sc: <.0005 wt%
Low in "feldspar" trace elements (Ba, Sr, Eu)	Sr: 22-91 ppm
Initial $^{87}Sr/^{86}Sr$ 0.703-0.712	0.707 ± .001 (Johnson and Denison, 1973)