

Figure 7. Normative plagioclase composition versus normative color index (both modeled) for 32 terrestrial rocks and Martian spectra (note that symbols for Martian spectra are different than in Figure 5). The shaded field represents typical terrestrial volcanic compositions [Irvine and Baragar, 1971]. The error bar associated with normative color index is based on the 1σ standard deviation of the sum of the mafic phases.

[Wyatt *et al.*, this issue]. The model-derived bulk SiO_2 and alkalis ($\text{Na}_2\text{O} + \text{K}_2\text{O}$) then can be plotted on the classification diagram of Le Bas *et al.* [1986] to classify unknown samples. It is important to note, however, that model-derived chemistries are not directly representative of the chemistries of the unknown spectra; they are dependent on and represent the composition of a comparable sample composed of the exact minerals contained in the end-member set and are thus subject to slight variability as a function of the end-members selected.

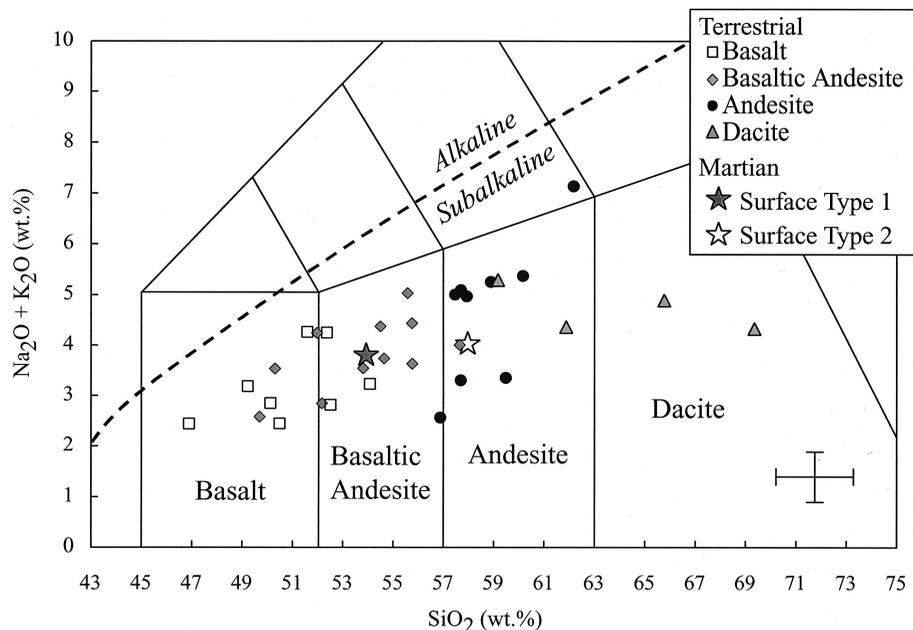


Figure 8. Chemical classification diagram showing model-derived chemistries for terrestrial 10 cm^{-1} data and Martian spectra (stars). Symbols are the same as in Figure 7. Error bars represent the uncertainties for silica and alkalis listed in Table 2.

Table 5. Summary of Classification Results for Martian Spectra^a

Sample	Classification Schemes			
	Spectral Fields	Modal Mineralogy	Mineral Chemistry	Bulk Rock Chemistry
Surface type 1	B	B	B	BA
Surface type 2	A	A	B	A

^aB, basalt; BA, basaltic andesite; A, andesite.

Figure 8 shows model-derived silica versus alkalis for the 32 terrestrial volcanic rocks of paper 1 plotted on the chemical classification scheme for volcanic rocks [Le Bas *et al.*, 1986] with our model-derived silica and alkali contents of the Martian surface spectra. Chemistries obtained from the modes derived in the present work place the Bandfield *et al.* [2000a] surface type 1 in the basaltic andesite category and surface type 2 in the andesite category. These results are consistent with the results of Bandfield *et al.* [2000a].

4.5. Summary of Classifications

The results of the four classification schemes are summarized in Table 5. Martian surface type 1 is classified as a basalt in three out of four cases, and surface type 2 is classified as an andesite in three out of four cases. This degree of consistency among the classification schemes is comparable to that obtained with terrestrial samples [Wyatt *et al.*, this issue]. These assignments agree very well with the compositional determinations of Bandfield *et al.* [2000a] and Christensen *et al.* [2000a] for surface types 1 and 2 and Cimmeria Terra.

The impact of significant abundances of weathering and alteration products is not addressed by this study, so future work is planned to investigate the impact of surface and inti-