

Fluorine geochemistry in biotite schists through a whole-rock K - F plot. Example of the Serido Belt - RN, Brazil.

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In mica schist and its sedimentary pelitic protoliths F replaces OH. Micas and clays are the main F carriers with apatite accounting minor contribution. Phyllosilicates also account for most of the K rock content. K and F rock contents allow to calculate normative rock biotite weight and maximum biotite F contents. In a K - F plot, biotite weight is read at the K-axis while biotite F content is read in diagonal isopleths.

Samples trends in the K-F plot are useful to analyze the F behaviour during metamorphism and related igneous processes affecting pelitic rocks. Biotite F content is controlled by T, biotite Mg-number and fluid $f_{\text{HF}}/f_{\text{H}_2\text{O}}$ ratios. K - F trends following biotite maximum F content isopleths should represent a single metamorphic set of fluid-rock equilibrium conditions for rocks with similar Mg-number. Trends that crosscut isopleths should represent different sets of metamorphic grade and/or rock and fluid composition.

In samples collected (n=36) from preliminary road profiles across the Neoproterozoic Serido mica schist belt, F contents vary from 450 to 3550 ppm (mean=987; sd= 835) and K contents from 1.41 to 5.56% (mean=2.25; sd=0.99). Biotite weight vary from 17 to 65% (mean=26; sd=12) and maximum F biotite contents from 0.2 to 0.7 % (mean=0.35; sd=0.13). Fluorapatite contributes a near invariable amount of 29% of the F rock content. A group of samples fall close to the biotite isopleth F = 0.25% whereas other groups show positive and negative trends crosscutting the F biotite isopleths.