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### **Sulfide-silicate interactions in medium-grade metapelitic schists of western and central Maine, USA**

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The types and modal amounts of sulfide minerals in garnet and staurolite-zone metapelites from western and central Maine have a distinct influence on coexisting silicate-oxide mineral assemblages, modes and mineral chemistry. The investigated metapelitic schists are graphitic and peraluminous, and are well-equilibrated. The sulfide-bearing schists most commonly contain pyrrhotite, minor chalcopyrite, and sphalerite, but the most sulfide-rich rocks contain pyrite. Pyrrhotite is commonly hexagonal, but locally the pyrrhotite converts to the low temperature monoclinic form. In general, as the modal amounts of sulfide increases (1) modal amounts of garnet and ilmenite decrease with garnet being absent in the sulfide-rich metapelites, (2) there is a general enrichment in Mg and Mn in all of the mafic silicate and oxide minerals and (3) rutile is present with or without Mn-rich ilmenite in the sulfide-richest metapelites. The sulfide-bearing metapelites can be viewed as if they were two components, a sulfide portion and the remaining silicate-oxide portion having an “effective” bulk composition reduced in Fe proportional to the amount of sulfide present. One of the petrologic benefits of using sulfide-rich metapelites is that compositional range of coexisting silicate minerals can be extended from relatively Fe-rich silicate compositions to nearly Mg end-members. In the case of biotite, the Mg/(Mg+Fe) ratios range from 0.3 to 1.0, and the Ti-saturation surface for peraluminous biotites coexisting a Ti-saturating phase could be empirically constrained as a function of temperature, biotite Mg/(Mg+Fe) ratio and Ti content of biotite. The presence of sulfides appears to have a relatively minor influence on the amount of S species in the metamorphic fluid.