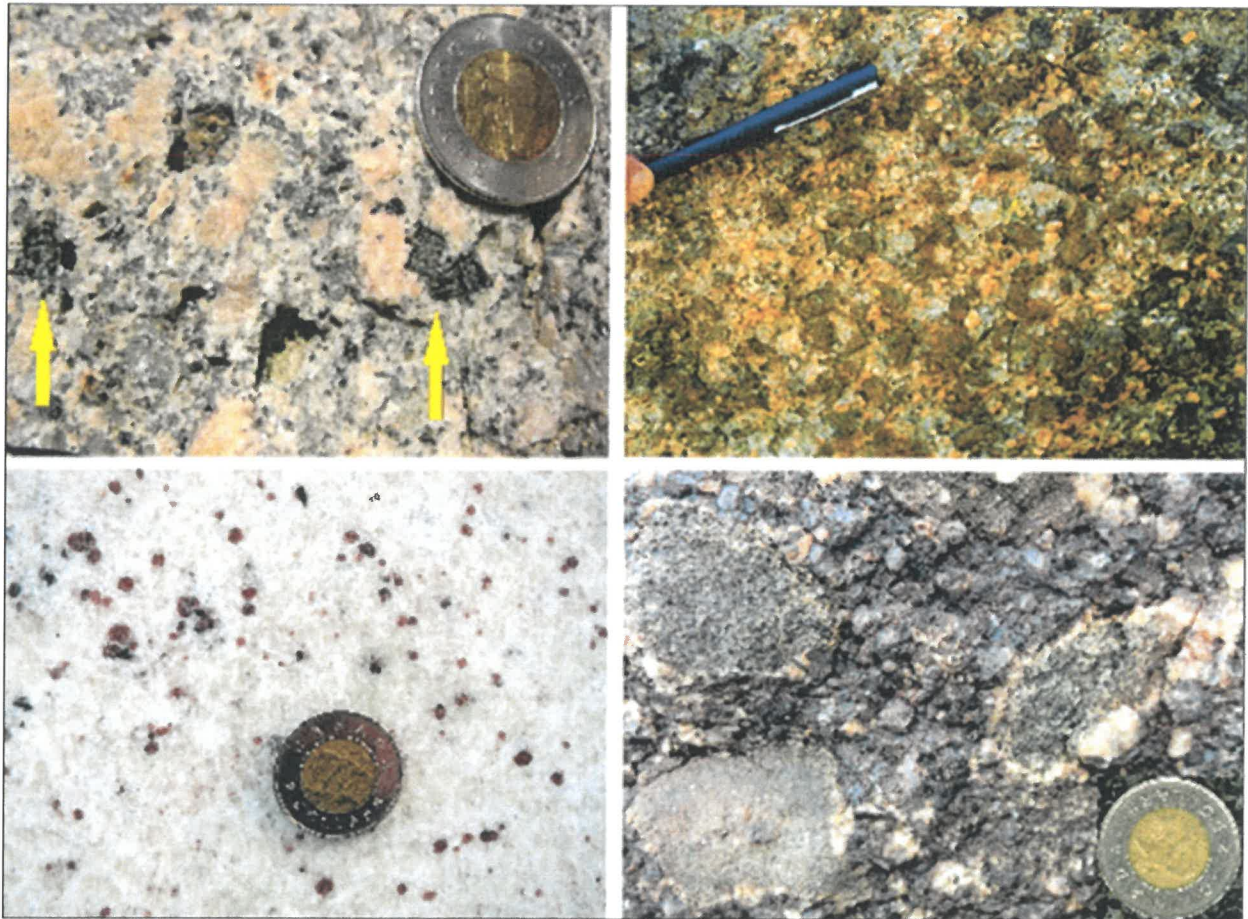


The Origins of Strongly Peraluminous Granitoid Rocks

Strongly peraluminous granites (SPAGs), with $\text{mol Al}_2\text{O}_3/\text{mol (CaO+Na}_2\text{O+K}_2\text{O)} \geq 1.20$, are relatively rare in the geological record. They contain variable, but significant, modal abundances of one or more of biotite, muscovite, cordierite, garnet, andalusite, topaz, and tourmaline, all of which sequester the excess alumina. Surprisingly, SPAGs are probably not the products of dehydration partial melting of peraluminous metasedimentary rocks (A/CNK too low), or the products of extensive melting of peraluminous metasedimentary rocks (A/CNK too high). Instead, SPAGs probably originate by the modification of more normal, weakly peraluminous, granite magmas by well-known processes such as restite unmixing, fractionation, contamination, fluid stripping, and hydrothermal alteration. In this presentation, I examine the efficiency of each of these processes, and use the South Mountain Batholith of Nova Scotia as a case study.



Strongly peraluminous granites with dispersed peritectic cordierite (upper left), cumulus cordierite of unknown origin (upper right), magmatic garnet (lower left), and cumulus garnet of unknown origin (lower right).