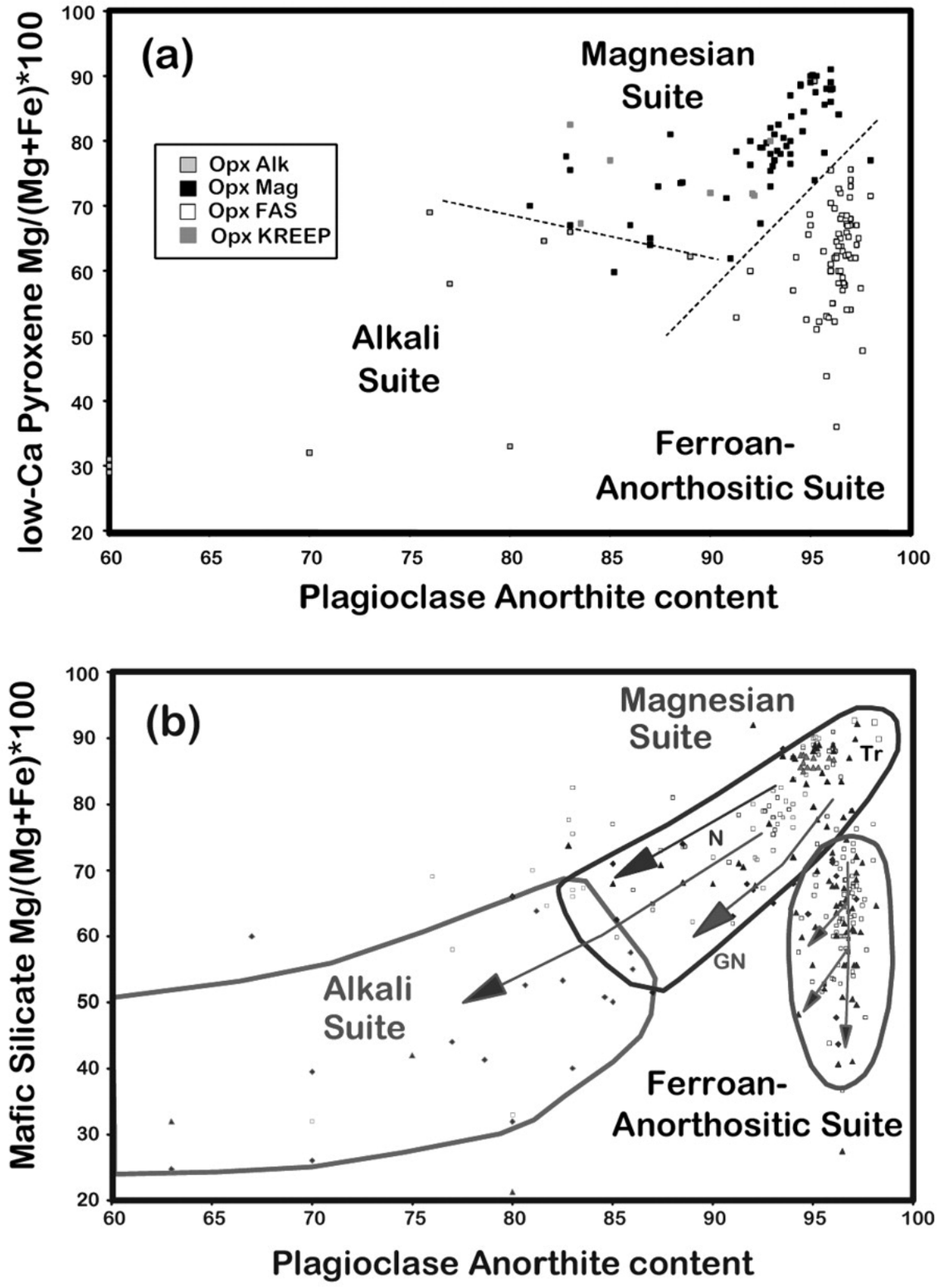

Mg/(Mg+Fe) in mafic silicates vs. anorthite content, Ca/(Ca+Na+K), of coexisting plagioclase in lunar crustal igneous rocks. (a) Orthopyroxene Mg/(Mg+Fe) vs. coexisting plagioclase An content, showing rock types divided into a ferroan-anorthositic suite (high An content and relatively ferroan orthopyroxene), magnesian suite (high Mg at high An, ranging to lower Mg at lower An), and alkali suite (plagioclase relatively enriched in Na and K, and relatively ferroan mafic silicates). Dashed lines represent values typically used to distinguish groups. Data are from the compilation by Warren (1993), supplemented with additional data from Papike et al. (1998). (b) Mg/(Mg+Fe) for all mafic silicates (olivine, low- and high-Ca pyroxene) vs. coexisting plagioclase An content for the intrusive igneous rock suites and KREEP basalts. Typical trends resulting from fractional crystallization (arrows) suggest a possible relationship between the magnesian- and alkali-suite rocks. The overall trend from upper right to lower left is similar to trends observed for rocks of terrestrial layered mafic intrusive bodies and is the general trend of fractionation of the minerals of KREEP basalt as determined from early crystallizing cores to late rims. The ferroan-anorthositic and Mg suites are difficult to relate through a common magmatic process. The near-vertical trend of the ferroan-anorthositic suite requires a more complex petrogenetic scenario (Herbert et al. 1978; Longhi and Boudreau 1979; Raedeke and McCallum 1980). Specific groups within the magnesian suite such as the norites (N) and gabbronorites (GN) appear to differ petrogenetically from each other and thus are shown associated with different fractionation