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Comprehensive chemical analyses of a cordierite from Kiranur, South India, and of an ilvaite from Serifos, Greece: Two new microprobe reference samples

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Abstract

A cordierite sample (42/IA) from Kiranur, South India, and an ilvaite sample (ISX1) from Serifos, Greece, have been characterized and prepared for use as potential electron microprobe reference samples. By combining different high-precision analytical methods, we determined the major-, minor-, and trace-element composition of these samples and demonstrated their near-stoichiometric composition and high homogeneity at the micrometer level. The chemical composition (working values) of ilvaite ISX1 is (in wt%): SiO_2 = 29.68%; Al_2O_3 = 0.67%; Fe_2O_3 = 34.72%; FeO = 18.67%; FeO_T = 51.52 %; MnO = 0.31%; MgO = 0.22%; CaO = 13.76%; H_2O = 2.21%; and of cordierite 42/IA is (in wt%): SiO_2 = 49.65; Al_2O_3 = 33.17%; FeO_T = 2.34%; MnO = 0.03%; MgO = 12.44%; Na_2O = 0.33%; H_2O = 1.21%; CO_2 = 0.59%. Aliquots of these samples for use as primary or secondary electron microprobe reference sample can be obtained on request.

Keywords: Cordierite, ilvaite, EMPA, LA-ICP-MS, ICP-OES, microprobe reference sample