New data on Ferrierite from Weitendorf near Wildon, Styria, Austria

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Zusammenfassung

Mit Hilfe verschiedener Analysenmethoden wurde die Formel des Ferrierit von Weitendorf berechnet. Außerdem werden die Gitterkonstanten angegeben.

Chemical analysis of the ferrierite from Weitendorf (Zirkl, 1973) was obtained as follows: Al_2O_3, SiO_2, K_2O, CaO, Fe_2O_3 by X-ray fluorescence according to the method of Franzini and Leoni (1972) modified by Leoni and Saitta (1974) to analyse small quantities of material (about 40—50 mg); Na_2O, K_2O, MgO, CaO, SrO, BaO, MnO, Fe_2O_3 by atomic absorption spectrometry according to the method of Loschi Ghittoni and Passaglia (1974) using a Perkin-Elmer 303 instrument. The values for K_2O, CaO and Fe_2O_3 were calculated as averages of the two methods. H_2O and CO_2 were determined by TG using a thermal analyser BDL. The resulted chemical percentages are: SiO_2 62.62, Al_2O_3 9.94, Fe_2O_3 0.58, MnO 0.06, MgO 2.61, CaO 5.78, SrO 0.18, BaO tr., Na_2O 0.13, K_2O 1.13, CO_2 3.91, H_2O 13.22, Sum 100.16. After the deduction of 8.89% of $CaCO_3$, the following chemical formula has been calculated on the basis of 72 oxygens: $K_{0.70}Na_{0.12}Ca_{0.41}Mg_{1.87}Mn_{0.03}Sr_{0.05}(Fe'''_{0.21}Al_{5.65}Si_{30.22})\ O_{72}.\ 21.28H_2O$. Both the framework content (36.08) very close to 36 atoms and the low balance error (+ 5,77) assess the reliability of the analysis.

Cell dimensions from powder pattern were derived by a least-squares refinement program using the reflections measured on a Philips diffractometer with Ni-filtered CuK_α radiation and Pb $(NO_3)_2$ as internal standard. The reflections were indexed by a method (Alberti, 1976) which takes into account the structure factors (Vaughan, 1966) when assigning the indices. By using only the spacings from 4.80 Å to 1.78 Å, i.e. excluding those too far from or too near to the standard lines, the lattice constants were: $a = 19.187(5)$; $b = 14.161(5)$; $c = 7.498(4)$ all in Å.

Recently, Wise and Tschernich (1976) found that in ferrierites the lower Si contents are accompanied by a predominance of divalent cations and all the ferrierite samples from basaltic rocks show a distinct preference for Mg over Ca. The Ferrierite from Weitendorf agrees well with these observations showing both a prevalence of Mg over Ca as requested by its occurrence (basaltic rock) and a predominance of divalent cations over the monovalent ones as requested by its quite low Si content. Finally, the reliability of the correlation equation between the *a* parameter and the Si content, proposed by Wise and Tschernich (1976), is supported by the good agreement here found between the Si content (29.62) calculated from the *a*-value and the Si content (30.22) determined with the chemical analysis.

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