SHORT COMMUNICATIONS

MINERALOGICAL MAGAZINE, MARCH 1973, VOL. 39, PP. 112–13

The effect of fluorine content on the determination of silica in quartzose rocks

DURING the author's research work on the geochemistry of granites and altered rocks from S.W. England, it was found that certain samples contained up to 3·0 % fluorine. The analytical method employed in the determination of silica was that of Jeffery and Wilson (1960), combining the classical gravimetric and the instrumental photometric procedures. However, loss of silica by volatilization as SiF_4 during the fusion is possible, and it was decided to experiment by spiking samples of pure quartz with varying amounts of fluorine (as NaF) in order to determine this loss. The experimental samples were treated and determined in exactly the same way as the unknown granites and altered rocks, i.e. Tema-crushing, fusion, gravimetry, and photometry. The results are:

Wt. quartz (gm.)	% F (as NaF)	Wt. % SiO_2 (grav., insoluble)	Wt. % SiO_2 (photo., soluble)	Total Wt. % SiO_2	Wt. % loss (on basis of 0·0 % F)
1·0001	0·0	99·59	0·18	99·77	—
1·0000	1·0	99·06	0·21	99·27	0·50
1·0000	2·0	99·10	0·25	99·35	0·42
1·0000	3·0	98·77	0·47	99·24	0·53

It is evident from these results that there is little difference in silica-loss between 1·0 % and 3·0 % added F, the figure being in the region of 0·50 wt. %, but that increased F-content results in an increase in the amount of soluble silica present in the gravimetric filtrate.

Thus, if quartzose rocks suspected of containing 1·0 to 3·0 % fluorine are determined by the combined gravimetric-photometric procedure, then the silica figure obtained is likely to be low by about 0·50 % SiO_2. This method compares favourably with the wholly-gravimetric and wholly-photometric procedures, subject to the limitations on iron, titanium, and phosphorus contents quoted by Jeffery and Wilson.

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An occurrence of gaspéite and pecoraite in the Nullagine region of Western Australia

GASPÉITE ($NiCO_3$) and pecoraite ($Ni_3Si_2O_5(OH)_4$) are rare secondary nickel minerals. Gaspéite was first defined by Kohls and Rodda (1966) as the nickel end-member of a $MgCO_3$–$NiCO_3$ solid-solution series, although they, themselves, did not actually discover pure gaspéite. The mineral from Quebec that they described was, instead, a magnesian gaspéite with a composition corresponding to $Ni_{0.98}Mg_{0.86}Fe_{0.16}(CO_3)_2$. Magnesian gaspéite and nickeloan magnesites have subsequently been reported from several localities in Western Australia (Morris and Pepper, 1968), but the only relatively pure gaspéite reported to date was found at Pafuri in the Transvaal province of South Africa (Mariano *et al.*, 1969).

Pecoraite was defined by Faust *et al.* (1969) as the nickel analogue of chrysotile. It was found as fracture fillings in the Wolf Creek meteorite of Western Australia, and no other occurrences have been reported to date.

Description of samples. The gaspéite and pecoraite described here are from a nickel prospect [Claim no. MC–517–L (Lionel)] near Spinnaway in the Nullagine district of Western Australia. The samples were obtained from Mr. P. J. Bridge of Perth, W.A., who in turn had received them from a prospector by the name of C. Otway. The occurrence will here be referred to as the Otway prospect.

The samples in which the gaspéite and pecoraite occur contain some sulphide minerals, notably millerite and polydymite, with the textures clearly indicating the partial replacement of millerite by polydymite. The sulphides are veined and encrusted by green carbonates and silicates, which include the gaspéite and pecoraite. Other minerals found in the samples include magnesite, siderite, chrysotile, antigorite, and magnetite. The carbonates and silicates in this assemblage are extremely fine-grained and are obviously of secondary origin. The gaspéite and pecoraite are generally in intimate intergrowth suggestive of co-precipitation, and it was only with some difficulty