Die fünf unterschiedlichen Sb-Punktlagen weisen in vier Fällen eine verzerrte trigonal pyramidale Koordination mit Sb-S Abständen um ca. 2,5 Å auf (+ weitere S-Atome bei ca. 3 Å). Das Sb5-Atom weist eine 2 + 2 Koordination mit Sb-S Abständen von ca. 2,4 und 2,8 Å auf. Die fast unverzerrten AsS_3-Pyramiden haben As-S Abstände zwischen 2,25 und 2,35 Å. Die As-Atome werden teilweise durch Sb substituiert, wobei der Ersatz in der kleineren Pyramide 1/5, und in der größeren 1/3 erreicht. Die Struktur besteht aus geknickten Ketten von SbS_n-Polyedern, die durch AsS_3-Pyramiden zu gewellten Schichten parallel (100) verknüpft sind (Abb. 1). Diese Schichten, welche teilweise eine PbS-ähnliche Struktur aufweisen, sind nur über Tl-Atome (bzw. TlS_8-Polyeder) verbunden und bedingen so die hervorragende Spaltbarkeit. Als Besonderheit besetzen Tl3 und Sb1 eine geteilte Punktlage zu je 50 %, wobei der Abstand zwischen den beiden Positionen nur 0,68 Å beträgt. Sowohl geometrische Argumente als auch Langzeit-Filmaufnahmen deuten darauf hin, daß diese Punktlage wohl statistisch besetzt sein muß.

Generell zeigt die Struktur Beziehungen zum Sulfosalzmineral Rebulit, $Tl_5Sb_5As_8S_{22}$ (BALIC-ZUNIC et al., 1982). So können ganz ähnliche Koordinationspolyeder beobachtet werden, parallel [100] sind fast idente Punktlagen zu finden. Bei Rebulit führt jedoch die unterschiedliche Verknüpfung der Polyeder zu einer Gerüststruktur, welche im Gegensatz zur Schichtstruktur von Jankovicit keine Spaltbarkeit aufweist. Eine andere, im weitesten Sinne ähnliche Schichtstruktur kann auch in synthetischem Parapierrotit beobachtet werden (ENGEL, 1980).

BALIC-ZUNIC, T., SCAVNICAR, S., ENGEL, P. (1982): The crystal structure of rebulite, $Tl_5Sb_5As_8S_{22}$. - Z. Krist., 160, 109 - 125.

CVETCOVIC, Lj., BORONIKHIN, V.A., PAVICEVIC, M.K., KRAJNOVIC, D., GRCETIC, I., LIBOWITZKY, E., GIESTER, G., TILLMANNS, E. (1994): Jankovicite, $Tl_5Sb_9(As,Sb)_4S_{22}$, a new Tl-sulfosalt from Allchar, Macedonia. - Mineral. Petrol. (im Druck).

ENGEL, P. (1980): Die Kristallstruktur von synthetischem Parapierrotit, $TlSb_5S_8$. - Z. Krist., 151, 203 - 216.

LIBOWITZKY, E., GIESTER, G., TILLMANNS, E. (1994): The crystal structure of jankovicite, $Tl_5Sb_9(As,Sb)_4S_{22}$. - Europ. J. Mineral. (zu Druck eingereicht).

CHLORITES FROM PEGMATITES OF THE ŽULOVÁ GRANITIC MASSIF (CZECH REPUBLIC)

LOSOS, Z.[*], SULOVSKÝ, P.[*], ZIMÁK, J.[**] and KRAUSOVÁ, D.[***]

[*] Dept. of Mineralogy, Petrology and Geochemistry, Masaryk University, Kotlářská 2, 611 37 Brno, Czech Republic.

[**] Dept. of Geology, Palacký University, tř. Svobody 26, 771 46 Olomouc, Czech Republic.

[***] Dept. of Inorganic and Physical Chemistry, Palacký University, Křížkovského 10, 771 46 Olomouc, Czech Republic.

The chlorites are typical minerals for pegmatites of the Žulová (Friedeberg) massif (age 300 M.A.), at the NE margin of the Bohemian Massif. Chlorite in the form of grey-green to black-green fine-grained to massive aggregates mostly fills the miarolitic cavities in central parts of pegmatite dykes as one of the successively youngest minerals. In literature this chlorite is called "strigovite" (for example KRUŤA, 1973), after the type locality of morphologically and paragenetically similar chlorite variety from the Strzegom-Sobótka massif (Poland). Apart of fine-grained chlorite masses, occur in the pegmatites of the Žulová massif also up to several cm^2 large flakes of chloritized biotite.

Two fine-grained chlorite types were recognized in studied mineral samples on the basis of paragenetic relationships, optical properties, infra-red spectra, XRD and electron microprobe analyses:

(1) black-green fine grained to massive chlorite forming relatively large (up to several cm^3), mostly monomineralic aggregates. They occasionally contain scarce muscovite, automorphic acicular apatite crystals, ilmenite laths, fine molybdenite scales. In the classification according to MELKA (1965) it corresponds to thuringite with F/FM = 0.75 - 0.82, Mn = 0.04 - 0.09 and Si = 2.56 - 2.72 ($Si + Al^{IV}$ = 4.00). Cell dimensions (in 10^{-10} m): a_0 = 5.37 - 5.38, b_0 = 9.25 - 9.31, c_0 = 14.20, β = 97.02 - 97.04°. Type locality: Černá Voda.

(2) grey-green fine-grained chlorite forming either monomineralic aggregates or aggregates composed of chlorite and K-feldspar (this assemblage is considered to be a product of the transformation of biotite). In the diagram after MELKA (1965) it corresponds to thuringite and chamosite with F/FM = 0.75 - 0.82, Mn = 0.07 - 0.14 and Si = 2.56 - 2.72. Cell dimensions: a_0 = 5.38, b_0 = 9.24, c_0 = 14.22, β = 96.93°. Type locality: Jašek quarry at Žulová.

For comparison, reference chlorite samples from the Strzegom-Sobótka massif (Poland) have been studied too:

(a) typical strigovite (aggregates of 30 - 40 μm crystals) - contains relatively more Mg (0.73 - 0.83) and less Mn (0.08)

(b) coarse-grained chlorite - contains relatively less Mg (0.25 - 0.35) and more Mn (0.13). Both subtypes can be classified (after MELKA, 1965) as thuringite, with F/FM = 0.82 - 0.85, Si = 2.62 - 2.75 (strigovite), F/FM = 0.92 - 0.94, Si = 2.64 - 2.71 (subtype b). Cell dimensions of both subtypes vary within a narrow interval: a_0 = 5.38, b_0 = 9.32 - 9.33, c_0 = 14.20 - 14.23, ß = 97.01 - 97.24°. Chemistry of chlorites from the Žulová massif corresponds to strigovite from Strzegom (See JANECZEK ,1985, too). All studied chlorites correspond to Mg-chamosite or chamosite in the classification of WEISS (1991).

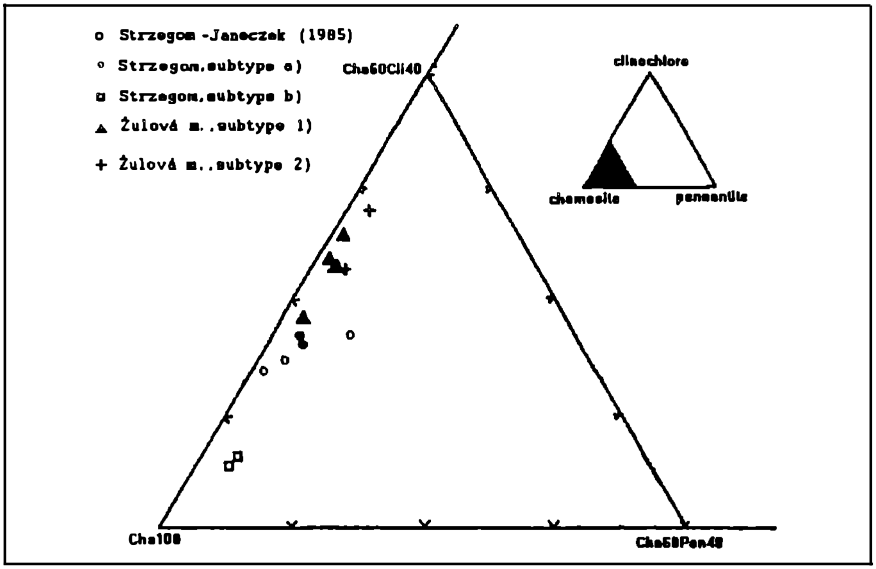

Fig. 1.: Chlorite triangle with end members chamosite, clinochlore and pennantite. With exception of analyses of JANECZEK (1985), all iron in chlorites is considered to be Fe^{2+}.

The examples of empirical formulas:

The Žulová massif:	
type (1)	$(Mg_{1.04}\ Fe^{(2+3+)}_{3.47}\ Al_{1.37}\ Mn_{0.08})_{5.96}\ (Al_{1.39}\ Si_{2.61})_{4.00}\ O_{10.00}(OH)_{8.00}$
	$(Mg_{0.86}\ Fe^{(2+3+)}_{3.69}\ Al_{1.38}\ Mn_{0.07})_{6.00}\ (Al_{1.40}\ Si_{2.60})_{4.00}\ O_{10.00}(OH)_{8.00}$
type (2)	$(Mg_{1.24}\ Fe^{(2+3+)}_{3.09}\ Al_{1.49}\ Mn_{0.07}\ Ca_{0.02})_{5.91}\ (Al_{1.29}\ Si_{2.71})_{4.00}\ O_{10.00}(OH)_{8.00}$
Strzegom:	
(subtype a strigovite)	$(Mg_{0.83}\ Fe^{(2+3+)}_{3.90}\ Al_{1.21}\ Mn_{0.08})_{6.02}\ (Al_{1.25}\ Si_{2.75})_{4.00}\ O_{10.00}(OH)_{8.00}$
(subtype b)	$(Mg_{0.31}\ Fe(2+3+)_{4.29}\ Al_{1.31}\ Mn_{0.12})_{6.03}\ (Al_{1.36}\ Si_{2.64})_{4.00}\ O_{10.00}(OH)_{8.00}$

KRUŤA, T. (1973): Silesian minerals and their literature. - Moravian Museum Brno, 414 pp., in Czech.

JANECZEK, J. (1985): Typomorphic minerals of pegmatites from the Strzegom-Sobotká granitic massif. Geologica Sudetica, 20, 2, 1 - 68, in Poland.

MELKA, K. (1965): Proposal of chlorite minerals classification. - Věstník Úst. Úst. geol., 40, 23 - 29, in Czech.

WEISS, Z. (1991): Interpretation of chemical composition and X-ray diffraction patterns of chlorites. - Geologica Carpathica, 42, 2, 93 - 104.