MICROMINERALOGY OF IGNIMBRITES OF SOKYRNYTSYA ZEOLITE DEPOSIT (TRANSCARPATIANS, UKRAINE)

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Ignimbrites stretching under clinoptilolite tuffs of the Sokyrnytsya deposit belong to the Teresvinskaya suite (Upper Tortonian). These ignimbrites consist of a) splinters of volcanic glass, b) magmatogenic minerals (fragments of crystals and entire, non-destructed crystals); c) newly formed minerals. In some areas felsitic texture changed into vitroclastic and crystalloclastic ones on the scale of a thin section. The shape of the glass splinters is formed by spherical surfaces of destroyed (blown up) gas bubbles. The indications of ignimbrites are as follows: a) crystals of magmatic feldspars and quartz are broken and cemented by rock of felsitic texture; b) highly deformed crystals of biotite; c) fragments of crystal are shifted and rotated in the plastic felsitic medium.

Phenocrysts of magmatic minerals are plagioclase (oligoclase–andesine #28–32 and andesine #40), quartz, sanidine and biotite. Apatite, zircon, magnetite are accessory minerals. Plagioclase, K-feldspar, quartz, cristobalite (?), mafic and opaque minerals and glass constitute microfelsitic groundmass. The main new mineral formations are adularia, albite and calcite. Muscovite, analcime and acicular zeolites occur sporadically. A cryptocrystalline bluish-green mica (polytypes $1M$ and $1M_d$) is a characteristic mineral of ignimbrites. This mica may be an alteration product of pumice inclusions.

Large idiomorphic crystals of quartz with high-temperature habit are not often observed but fragments of this quartz prevail in the rock. The later quartz forms accretions of prismatic crystals on the faces of adularia.

Idiomorphic transparent crystals of plagioclase can reach 1-2 mm in size but they occur only occasionally. Zoned crystals are rarely observed. Twins according to the albite law are predominant but crystals are often untwinned or the twins are built up by a few wide domains only. Plagioclase (oligoclase–andesine) is the main clastic material of ignimbrite.

Phenocryts of sanidine are seldom, but crystal fragments are common. In rare cases anisotropic strips similar to "tweed orthoclase" are observed.

The main femic mineral of ignimbrites is mosaic-textured biotite (0.1–2.0 mm). Small crystals are concentrated in the felsite. They are strongly deformed (curved, folded, split).

Adularia is widespread postmagmatic mineral of the welded tuffs of Sokyrnytsya deposit. It forms small (less than 0.05 mm) crystals substituting the fragments of volcanic glass. Adularia growing in the pores of the rock creates fine microdruses. Its crystal forms according to SEM studies are {110}, {001}, {–201}, {100}. Adularia crystallized on the boundary of glass and felsite and a complete substituting of glass can be observed sometimes. An interesting peculiarity of adularia from the Sokyrnytsya ignimbrite is the low degree of Si/Al-ordering in the structure ($2t_1$ = 0,58–0,62); it is comparable with the degree of Si/Al-ordering in sanidine. Calcite forms aggregates of grains, which recrystallized into large mosaic crystals.

Melt inclusions are always present in magmatic minerals (plagioclase, quartz). Every inclusion have rectilinear shape and they are oriented along crystallographic axes. Homogeneous glass inclusions prevail. Gas bubbles in glass inclusions can be observed very seldom, however the gas may be hidden among recrystallized grains. So these inclusions reflect different degree of gas saturation of magmatic melt. Inclusions in adularia have never been observed.

Formation of adularia of ignimbrites is connected to the influence of hot mineralizing solutions on rhyolite-dacite glass. The heat source was the large mass of hot ignimbrite. Vertical loading and transfer of plastic ash materials (incompletely consolidated fallen aerosol) caused opening of the gas microbubbles and saturation of the solution by CO_2. Adularia crystallized as a metastable phase immediately from volcanic glass. It is suggested that the low degree of Si/Al-ordering in the structure of adularia was inherited from the amorphous glass.