

## MINERALOGICAL CHARACTERIZATION OF THE TEISER KUGELN (VILLNÖSS/FUNES, SOUTH TYROL)

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The Teiser Kugeln are found as geodes in basaltic andesites and andesites, both of Lower Permian age and part of the Athesian Volcanic District (VISONÀ et al., 2007), located in the Villnöß/Funes valley, South Tyrol. Their name is derived from the occurrence near the village Teis/Tiso. So far, minerals in the mm- to dm-sized geodes were identified optically only, but never analytically. Therefore, and in order to study the formation of the geodes, their mineralogy and relations of present mineral phases, qualitative analysis of minerals in the Teiser Kugeln was conducted using Raman spectroscopy (RS) and single-crystal X-ray diffraction (XRD).

Typically, the geodes show a chalcedonic rim and a coarse-grained crystalline quartz filling. The quartz filling can be complete or incomplete, the latter leaving space for other minerals to grow. Calcite was identified macroscopically, as well as several different varieties of quartz, i. e. rock crystal, amethyst and milky quartz. Prehnite ( $\text{Ca}_2\text{Al}_2\text{Si}_3\text{O}_{10}(\text{OH})_2$ ), datolite ( $\text{CaBSiO}_4(\text{OH})$ ) and the zeolites chabazite ( $(\text{Na},\text{K},\text{Ca},\text{Na},\text{Mg},\text{Sr})_{1.8-4}\text{Al}_{3-4}\text{Si}_{8-9}\text{O}_{24} \cdot n(\text{H}_2\text{O})$ ) and stilbite ( $(\text{Na},\text{Ca})_{5-9}\text{Al}_9\text{Si}_{27}\text{O}_{72} \cdot 28(\text{H}_2\text{O})$ ) were identified by RS and XRD.

Prehnite forms either greenish spheres or greenish-white to yellowish-white aggregates of tabular crystals (Figure 1: A, C). Chabazite occurs as transparent cubes that have the lustre of glass (Figure 1: C). Stilbite is found in columnar-shaped, translucent crystals (Figure 1: B). The milky tabular datolite crystals exhibit a distinct glassy lustre and form a coating in the cavity. Sphere-like hematite inclusions were found sporadically in amethyst crystals.

The crystallization sequence (from outside to inside) starts with chalcedony (agate), followed by coarse-grained crystalline quartz, and calcite. Prehnite, chabazite, datolite and stilbite represent the last crystallization stage and occur frequently as coatings inside the cavities, overgrowing all other phases.

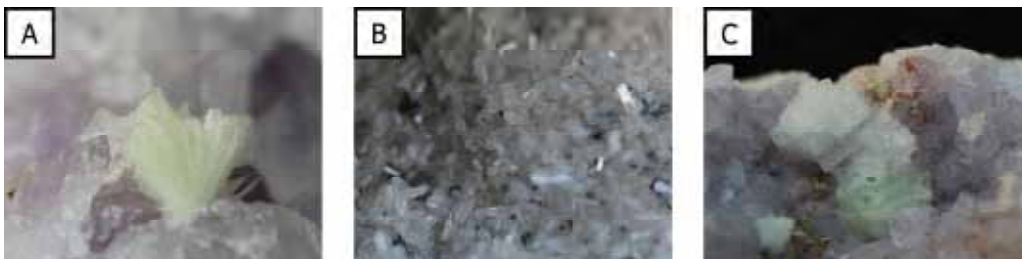


Figure 1. Examples of the analysed minerals. A: Prehnite; B: Stilbite; C: Green prehnite and white cubical chabazite (with a non-visible prehnite coating)

VISONÀ, D., FIORETTI, A.M., POLI, M.E., ZANFERRARI, A., FANNING, M. (2001): Swiss J. Geosci, 100, 313-324.