SUMMARY

Salesiova výšina Hill near Osek is located in the NW part of the Most Basin in the Krušné hory Fault Zone, in the northern part of the Bohemian Massif. Miocene sands and sandstones exposed to the surface are hardened into quartzite in their top parts. Blocks of a quartzite layer approximately 10 m thick, redeposited by gravity movements and faulting, lie at different heights above the sea level. The largest altitude difference of the correlative horizon, identified by the highest silicification intensity and by the presence of fossil roots and bivalve shells, is 60m.

Based on field and microscopic studies, the following mineralization types were distinguished: pre-silicification Fe-mineralization (i.e.,.tube-like incrustations elongated perpendicular to the Krušné hory Fault), silicification (formation of quartzites), post-silicification Fe-mineralization (connected with faults and joints in quartzites), and younger epigenetic mineralization (i.e., jarosite on tectonic planes). These types of mineralization mostly form secondary cements in the Tertiary detrital sediments. The intensity of silicification is balanced or decreases downwards. Quartzite forms subhorizontal planar bodies whose distribution is linked with the course of the Krušné hory Fault.

Four generations of diagenetic quartz (Q2 to Q5; mostly α-quartz) associated with the silicification process were distinguished. Overgrowths (Q3) around detrital grains are the most important ones as for their volume. Zoning and other fabrics of these overgrowths in SEM-CL reflect changes in fluid composition as well as variations in the rate of silica precipitation. In the final stages of the silicification process, microquartz (Q4) was precipitated, sometimes accompanied by kaolinite, followed by the precipitation of megaquartz (Q5), sometimes accompanied by jarosite (indicating pH ~3).

The silicification of quartzose sandstones and sands of Tertiary age was caused by circulation of groundwater and its advective flow along the Krušné hory Fault Zone. Water of low temperature (< 50-60 °C) was enriched in dissolved silica, mainly derived from the Teplice ryolite. Silicification at Salesiova výšina Hill is thus similar to groundwater silcretes in some aspects (mainly the primary precipitation of α-quartz and the mechanism of lateral fluid migration).