

## Geodynamic significance of Early–Middle Silurian volcanism of the Frauenalpe south of Murau (Stolzalpe Nappe)

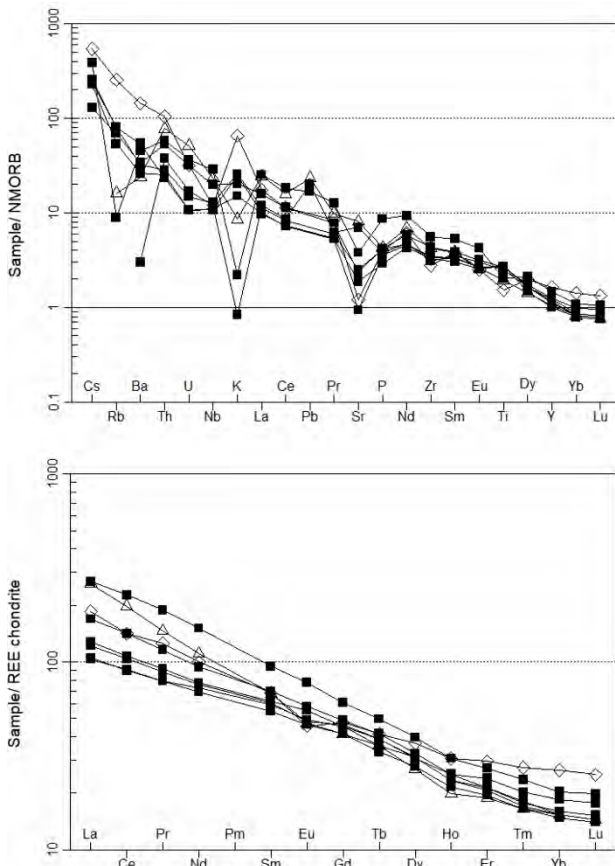
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The Early Palaeozoic geodynamics of the Austroalpine units is still uncertain to a wide extent because of lacking of high-quality data. To understand the geodynamic signification of Silurian volcanism of the Stolzalpe Nappe, ten representative rock samples of greenschists of the “Metadiabasserie” (THURNER, 1958) with an expected low degree of fraction have been analysed by petrography, microprobe analysis and geochemical methods. The compositional range of volcanic products includes greenschists, gabbroic-dioritic to trachytic sills and ash tuffs. Based on chitinozoa from slates intercalated within mafic volcanics, SCHNEPF (1989) postulated an Early to Middle Silurian age for this volcanic succession. According to our new results, the Silurian volcanism is characterized as mild-alkaline within-plate volcanism. Magma has been erupted in an intra-plate setting and the variety of volcanic structures ranging from lava flows, sills to ash-

tuffs indicate a shallow marine setting. Geochemical results, particularly and multi-element variation diagrams and rare earth element patterns (Text-Fig. 1) show the mild alkaline nature affected only by subordinate plagioclase fractionation. Intraplate volcanism is connected with mantle plume volcanism occurring during Early to Middle Silurian times. The binary La/Sm vs. Sm/Yb diagram (ZHAO & ZHOU, 2007) suggests melting of basalts from a garnet lherzolite source. Classical discrimination diagrams (e.g. the Nb/Y vs. Ti/Y diagram, PEARCE, 1982) indicate a within-plate origin of these greenschists.

During the Early Alpidic mountain building processes, the rocks experienced low-grade metamorphism, which is shown by the rocks within the region appearing as sub-greenschist to greenschist-facies metamorphic rocks with its origin in basalt, rare trachyandesite and andesite derived from a garnet-bearing lherzolitic upper mantle. Although significant problems exist on age assignment and correlation (HUBMANN et al., 2014), this type of volcanism is not only widespread within the basement of the Stolzalpe Nappe, but also in the Northern Greywacke zone and Graz Paleozoic unit of the Eastern Alps (LOESCHKE, 1989). A more detailed correlation might reveal a potential spatial shift of volcanism and better constraints on the paleo-environment.



Text-Fig. 1: Chemical variation diagrams of mafic rocks from the Frauenalpe. Above: N-MORB-normalized multi-element variation diagram after MCDONOUGH & SUN (1995). Below: Chondrite-normalized rare earth element pattern, normalized after data of ANDERS & GREVESSE (1989).

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