

Abstract

The crust mantle interaction during orogenesis is a major issue in understanding deep seated thermomechanical processes in large orogens and behavior of subcontinental mantle during continental collision in particular. European Variscan belt offers an exceptional opportunity to study tectonic interactions between mantle and orogenic lower crust thanks to the presence of bodies of garnet- and spinel-bearing peridotites of variable size included in largest Ky–Kfs granulite massifs.

This thesis consists of three principal chapters which apply different techniques and respond to different questions related to peridotite origin and their behavior in crust. The first chapter deals with combined structural and petrofabric study of Mohelno peridotite and attempt to explain mechanical behavior of peridotite thrust sheet in the frame of polyphase tectonic history of continental root. Our dataset shows good mechanical coupling between peridotite sheet and host felsic granulite, pointing to relatively low rheological contrast between upper-mantle and lower-crustal rocks in lower crust conditions. The second chapter deals with analysis of development of serpentinisation and AMS fabric in shallow crustal levels during final exhumation stages. An attempt is made to understand magnetic fabric from this highly serpentinized peridotite, its link to the olivine and pyroxene microstructure and tectonic evolution of the whole area. The third chapter is devoted to geochemistry and petrogenesis of peridotite together with a model of origin of host rock before orogenesis. The third chapter is focused on the geochemical, petrogenetic and geochronological investigations of one of the most prominent lower crustal complex in the core of Variscan orogen – the Náměšť Granulite Massif located at the eastern margin of the Bohemian Massif. This chapter is specifically dealing with a new set of whole-rock geochemical data, petrophysical properties of the rocks and sensitive high-resolution ion-microprobe (SHRIMP) U-Pb zircon *in situ* dating of mineral fabrics in granulites in particular. Finally, the last part are general conclusions of so far achieved results combined with some new petrological data and a perspective of large scale geotectonic model of the eastern branch of the Bohemian Massif orogenic lower crust.