SUMMARY

The České středohoří Mts. forming the most important and active part of Ohře/Eger rift are formed by volcanic rocks of Tertiary age containing upper mantle xenoliths which can provide us information about internal structure of upper mantle. This diploma thesis is focused on the study of mantle xenoliths from this part of Bohemian massif close to the city Litoměřice (4 locations: Dobkovičky, Prackovice, Kuzov, Medvědí hill) and for comparison another 4 locations of mantle xenoliths from the northern Bohemia locaties Brtníky in Šluknovský ledge, Kraslice and Zámeček at Fláje in Krušné Mts. and Venuše volcano in Nízký Jeseník at Bruntálská Highlands. Almost all studied xenoliths are spinel harzburgites or lherzolites with mineral association olivine + orthopyroxene + clinopyroxene + spinel (the most often Cr-spinel). They have usually protogranular texture followed by porfyroclastic texture (porfyroclasts are represented by olivine, orthopyroxene and in some cases also by clinopyroxene, and fine-grained matrix of all these minerals with olivine showing undulose extinguishes). An equigranular texture is the least common. Host rock of the xenoliths is always basanite. The most abundant mineral in peridotite xenoliths is olivine with #Mg value 89,4-91,5; followed by orthopyroxene with #Mg value 90,8-92,1 and clinopyroxene (Cr-diopside). The least abundant is Cr-spinel with large variation in #Cr values between 16,9 and 77,4.

The equilibrium temperatures were calculated using several geothermometers obtaining the best reliable results with two-pyroxene geothermometer of Brey and Kohler (1990). Calculated temperatures varied from 850 to 1062 °C for xenoliths from České středohoří Mts. and between 869 and 940 °C for xenoliths from Brtníky, Kraslice, Zámeček u Flájí and Venuše volcano. If these temperatures reflect truly primary conditions, all the xenoliths were most likely derived from similar pressure-temperature conditions.

The whole-rock geochemical analyses show a highly refractory character of the studied peridotites. Trace element contents are highly variable and show depleted nature of mantle peridotite in case of compatible elements, but strong enrichment in incompatible elements. Comparing to primitive upper mantle, all xenoliths are enriched in Rb, LREE, but depleted in Th, MREE and distinctly in HREE. These geochemical patterns suggest that upper mantle underwent variable partial melting degrees during melt extraction and subsequent metasomatism most likely by basaltic melt.