SUMMARY

The thesis deals with distribution and determination of natural radionuclides occured in primary and secondary mineralization of Jánská vein, which represents the part of uranium – polymetallic deposit of Březové Hory, Příbram polymetallic district.

Mineralization of the vein is very variable, especially that of secondary U, Pb and U-Pb phases presence. Moreover, some of the phases have the origin in present or recently passed times.

The aim of the investigation was to determine the contents of radioisotopes in the primary and secondary mineralization with the help of non-destructive and destructive methods of alpha spectrometry. The dating of secondary mineral phases was provided on the basis of radioactive disequilibrium of ^{230}Th /^{234}U radionuclides.

Non-destructive alpha spectrometry was selected for its simplicity as a method eligible for qualitative analyses of the enormous number of samples. During the quantification of the results of non-destructive alpha spectrometry, the activities, radioisotopic concentrations and isotopic ratios of ^{238}U/^{226}Ra and ^{210}Po/^{226}Ra were calculated. The method applied on the whole set of samples was verified by reference materials CRM 129-A (uranium oxide) and BL-5 (uranium ore).

Uranium and uranium equivalent concentrations of its daughter products in studied minerals range from 0,0066 % U (galenite) to 82,8 % U (uraninite). Most of the secondary minerals is not in radioactive equilibrium (U > Ra), on the contrary Ra > U occured in one case only (amorphous Mn oxides).

Group of ten secondary U-minerals was selected from the set of samples studied by non-destructive method. These samples were set out for other measurements using destructive alpha spectrometry and consequently for dating by ^{230}Th /^{234}U isotopic method.

Separation of uranium and thorium fraction by UTEVA® sorbent together with the application of internal standard of ^{232}U/^{228}Th isotopes was used for destructive alpha spectrometry. The method was optimalized and verified on the standard HU-1 (Harwell uraninite) in radioactive equilibrium. Wide range of calculated ages of secondary uranium minerals occures, e.g. 6,2 (±0,9) ka for lodevite and 199,4 (±46,1) ka for kasolite. Three of the samples were in radioactive equilibrium (minimal age over 155 ka). The occurence of minerals with abnormal isotopic association is very interesting. The mineral jarosite contain daughter isotopes of desintegration series of ^{235}U (^{227}Ac and ^{223}Ra) as a priority.^{230}Th and ^{210}Po isotopes were identified in young mineral beudantite. Its age was dated on 69,3 (±16,1) years by the isotopic pair ^{226}Ra/^{230}Th, the activity of ^{210}Po indicates the age of 108,1 (±9,0) years. Also the age of young widenmannite was calculated on 115,9 (±15,6) years using ^{210}Pb method.