This bachelor thesis deals with thermal stability of icosahedral phase in Mg-Zn-Y alloys. To study this phenomenon, samples of Mg-3.5Y-35Zn alloy were prepared and equal channel angular pressing method (ECAP) performed at two different temperatures was used to refine their microstructure.

Phases in the samples were characterised by scanning electron microscopy and energy-dispersive X-ray spectroscopy. Strengthening effect of icosahedral phase (I-phase) with quasicrystalline structure was examined by measuring Vickers hardness of the samples. Temperatures at which precipitation and dissolution of various phases occur were studied by differential scanning calorimetry. Finally, defect recovery with increasing temperature was investigated by means of positron annihilation lifetime measurement. To identify chemical elements surrounding dislocations coincidence measurements of Doppler broadening of annihilation peak were conducted.

Obtained results are as follows. Icosahedral dendritic structures are stable in Mg-3.5Y-35Zn alloy at temperatures up to 350 °C, at higher temperatures they are dissolved in the matrix. Recovery of dislocations takes place in the temperature range from 140 °C to 260 °C and leads to decrease in strength of the alloy processed by ECAP. Concentrations of zinc and yttrium are not enhanced in the vicinity of dislocations and dislocation density in the alloy annealed at 300 °C fell below $0{,}5 \cdot 10^{13}$ m^{-2}.