

The aim of this bachelor's thesis was to investigate the precipitation processes in the binary system Mg-Y and the ternary alloy Mg-Y-Nd using positron annihilation spectroscopy and hardness testing, where we measured 2 samples with 3% and 6% by weight representation of Yttrium impurity atoms and 3 sample with 4% by weight representation of yttrium atoms and 3% by weight representation of neodymium atoms. The development of the hardness of the alloys was measured by the Vickers method of hardness measurement. Together with the hardness measurement, the characterization of crystal lattice disorders of the cloudy alloy samples was carried out using positron annihilation spectroscopy. It was measured that at higher temperatures hardening of the studied systems occurs. Hardening was caused by the formation of GP zone precipitates and the  $\beta'$  phase by Y, Nd and Mg atoms.