

The objective of the thesis is the study of mechanical properties, microstructure development and corrosion resistance of technical purity copper and Cu-0.18 wt.% Zr polycrystals prepared by ECAP. The tensile tests showed that the characteristic stresses $\sigma_{0.2}$ and σ_{max} increase with increasing strain imposed by ECAP. The improvement of mechanical properties is compensated by the drop of ductility in the deformed state. The microstructure after 8 passes of ECAP is almost homogeneous consisting of equiaxed grains of the average size of 200 nm. The severe plastic deformation resulted in the grain size reduction of the factor of 1000. The specimen after 8 passes contains almost 50% of high angle grain boundaries. From the thermodynamic viewpoint the deformation did not change significantly the corrosion properties. However, the corrosion in the deformed material is slower and much more homogeneous.