

Summary of PhD thesis

**INFLUENCE OF ROUGHER FLOTATION OPERATING CONDITIONS ON  
METALLURGICAL PERFORMANCE OF COPPER ORES**

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**Key words:** copper flotation, sulfide minerals liberation, rougher flotation

The copper feed grade directed to the KGHM Polska Miedź S.A. mineral processing plants shows a tendency to decrease, which is mostly caused by ore deposit depletion. Due to the changes in mineralogical and petrographic properties of copper ores mined in the current areas of deposit exploitation, it can be expected, with the existing technology and the current conditions of mineral processes that these unfavorable trends will continue. Therefore, it is necessary to develop new technical and technological solutions aimed at ore processing efficiency.

The main objective of this thesis is to determine the possibility to improve the efficiency of Rudna Plant rougher flotation process by reducing negative influence of the non-liberated sulfide minerals on flotation copper recovery by applying optimized hydrodynamic conditions.

An industrial rougher flotation research has been carried out to analyze the effects of air flow rate and impeller linear velocity on metallurgical performance. Feed, concentrate and tails samples were designated to chemical and particle size analyze. The selected tests products were further analyzed using computerized mineral analysis to establish a size-by-size mineralogy in order to figure out the reasons of copper losses in final tailings.

Received results indicated the possibility for the rougher flotation improvement effectiveness. By setting impeller linear velocity at 6.40 m/s level, and slurry aeration at 7 m<sup>3</sup>/min level, it was possible to minimize losses of liberated copper sulfide minerals in the final tailings.