

## USAGE OF $\text{Fe}^0$ FOR TOXIC ELEMENTS SORPTION FROM MINING AREAS WATERS

### POUŽITIE $\text{Fe}^0$ AKO VHODNÉHO SORBENTU POTENCIÁLNE TOXICKÝCH PRVKOV VO VODÁCH Z BANSKÝCH OBLASTÍ

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#### **Abstract:**

Laboratory experiments with usage of  $\text{Fe}^0$  for cleaning of contaminated waters from Sb-mining area were the part of detail interdisciplinary study of five abandoned Sb-deposits (Pernek, Medzibrod, Dúbrava, Čučma a Poproč) in Slovakia. This study was focused on evaluation of different environmental components contamination, processes of migration and bounding of toxic elements and suggestion for affected area remediation.  $\text{Fe}^0$  chips (commercial product) and Fe paring (waste from Fe machining) was used as a tested sorption material. Sorption materials were activated by 5 M HCl (10-15 minutes) and than washed to the pH 7 of the washing water. Mixture of  $\text{Fe}^0$  with magnezite and dolomite grain was used as a filling of experimental tube.

Efficiency of tube experiments was very high (more that 90%) for waters from all studied localities. The available filling medium was pure  $\text{Fe}^0$ , contrast in usage of different form of  $\text{Fe}^0$  wasn't observed. Continues increasing of  $\text{SO}_4^{\text{II}}$  and decreasing of pH value in outflowing waters was observed. Usage of  $\text{Fe}^0$  and carbonates mixture as a filling material for remediation is necessary for elimination of unfavourable trend.

#### **Keywords:**

antimony, arsenic, remediation, sorption, elementary  $\text{Fe}^0$