DAVID STONE, Department of Chemistry, West Virginia State University, Institute, WV 25112, and Dr. Ernest Sekabunga, Department of Chemistry, West Virginia State University, Institute, WV, 25112. Aqueous Metal Ion Extraction: Manganese (II), Nickel (II), Copper (II), and Zinc.

Water discharged as result of coal mining activity, referred to as acid mine drainage (AMD), is acidic and laced with metal ions; such as those of iron, manganese, and aluminum. A common technique of removing pollutant metal ions from water is precipitation, which involves the formation of insoluble metal compounds that fall out of solution. We are proposing the extraction of metal ions from aqueous solution by complexation utilizing monoamine-, diamine-, and triamine-functionalized silica gels. The $[M^{2+}]_i$ (0.01 M) were determined by complexometric titration using the disodium salt of EDTA with indicators Eriochrome Black T (Mn^{2+} and Zn^{2+}) and Murexide (Cu^{2+} and Ni^{2+}). The ligands: monoamine, diamine, and triamine; were then added in varying metal ion : ligand (M:L) ratios. After stirring and filtering the solutions, the $[M^{2+}]_f$ was determined by complexometric titration. Metal ion extraction of over 90% for Mn^{2+} and Zn^{2+} has been achieved utilizing monoamine-, diamine-, and triamine-functionalized silica gels, and up to ≈100% extraction for Cu^{2+} and Ni^{2+} using monoamine functionalized silica gel. We also investigated the possibility of recovering the extracted Mn^{2+} ions from previous trials using nitric acid and regenerating the diamine functionalized silica gel using sodium hydroxide. A 70 % recovery of the Mn^{2+} was achieved. This research was supported in part by WV NSF EPSCoR and NASA West Virginia Space Grant Consortium.