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Potential Occurrence Assessment of Acid Rock Drainage through a Geochemical Stream Sediment Survey

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During large constructions of roads or structures, unexpected acid rock drainage (ARD) can be caused by local mineralization containing sulfides in the geology. The potential of ARD occurrence of a certain area sometimes must be assessed before initiation of any engineering earth works. In this study, a new prediction protocol using a geochemical exploration survey technique of stream sediment is proposed. Sediment samples were collected at the case study area, and the contents of some major and heavy metal elements were compared according to the major geologies of the sampling points. The modified geoaccumulation indices (I_{geo}) of Fe, Pb and As could indicate a possible zone of pyrophyllite mineralization, which may cause the occurrence of ARD at the study area. Using the enrichment index of the three elements relative to the median values of the area, a high potential zone of ARD could be designated, which was in agreement with the laboratory ARD prediction tests of the rock samples. In the other areas with different mineralization processes, other metallic elements can be selected as indicators of the ARD potential. Likewise, the potential of the occurrence of ARD at an area can be assessed by evaluating the geochemical distributions and drawing the indicator elements for ARD through a stream sediment survey.

Biography:

Dr. Joo Sung Ahn is the Director of Geo-Environmental Hazard Research Center of KIGAM. He received Ph.D. (2000) in Environmental Geochemistry from Seoul National University, Korea. His research interests are geochemical investigation and remediation of contaminated environments. Currently, he focuses on research center operations and research project management.