

### Copper recovery/removal system based Cu-binding aptamer from the acid mine drainage

이상희, 엄현주, Simranjeet Singh Sekhon, 권순동<sup>1</sup>, 민지호<sup>2</sup>, 김양훈\*  
충북대학교; <sup>1</sup>한국광해관리공단; <sup>2</sup>전북대학교  
(kyh@chungbuk.ac.kr\*)

Increasing industrialization and urbanization worldwide had substantially ravaged our environment through the discharge of industrial and domestic wastes. Although it becomes mandatory for industries to treat these wastes before disposal, it is very difficult to solve Cu recovery and/or removal from the industrial waste solution because the nature of Cu waste appeared to become very complex and hazardous. For these reasons, it is important to development of new approach for the recovery/removal of Cu from industrials waste solution. In this study, we have developed a new approach for Cu removal/recovery system by DNA aptamers. The aptamers were in vitro selected using Copper-chelate affinity column and Cu binding properties of Cu-aptamer were investigated by fluorescent chip, surface plasmon resonance (SPR), and scanning electron microscopy (SEM). Here we demonstrate Aptamer Integrated Recovery Platform (AIRP) to make recovery of copper from the acid mine drainage. To the best of our knowledge, AIRP is the first demonstration of copper specific removal and recovery using aptamer, and it can have diverse applications in Copper-mining and recycle industry.