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# RECYCLING

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## Influence of aqueous conditions for electrolytic recovery of rare earth elements (REEs) from REE mine wastewater

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**Statement of the Problem:** Research on the recovery of heavy metals in rare earth element (REE) mine wastewater and the treatment of harmful substances have been actively carried out in order to reduce environmental pollutions and generate valuable REE-based resources. However, studies on electrolytic REE recovery directly from REE mine wastewater are very lacking because the content of REE metals contained in the wastewater is considerably low compared with its process cost and more importantly it is known that REE ions are very difficult to be electrochemically reduced to REE metals due to very low redox potentials.

**Findings:** In this study, we propose a high-efficiency, low-cost REE recovery technology from REE mine wastewater, which is being developed using the principle of electrolytic recovery in an aqueous solution. Electrowinning of erbium (Er), ytterbium (Yb) and thulium (Tm) among REEs were studied using acidic chloride solutions, and the influence of its process parameters on the chemical composition and metallurgical phases of reduced REE-based deposits were also investigated.

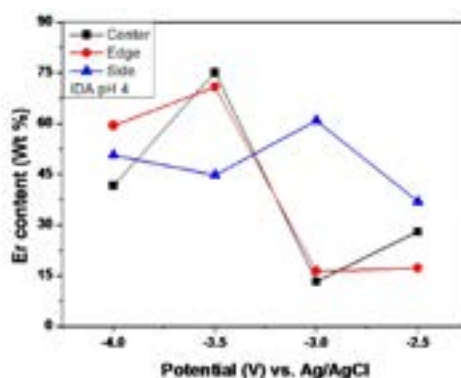


Figure 1: Influence of constant reduction potential on the Er content of electrodeposits in an IDA-chloride solution of pH 4.

### Biography

Sunjung Kim currently works as a Professor in the School of Materials Science and Engineering in the University of Ulsan, Korea. He has expertise in the application of electrochemistry theories and experiments to various industrial fields including urban mining, mining resources development, secondary battery, microelectronics, optoelectronics, etc. He obtained a MS and a PhD from Rensselaer Polytechnic Institute in USA after receiving a BS from Seoul National University in Korea. He has 4 years of working experience in Samsung Electronics and LG Electronics before joining the Faculty of the University of Ulsan in 2008.

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