

News and Highlights**Breakthrough in the China's Separation Technology for
Extraction of Rare Earth Elements**HAO Ziguo^{1,2}, FEI Hongcai^{1,2}, LIU Lian^{1,2} and Susan TURNER²*1 Chinese Academy of Geological Sciences, Beijing 100037, China**2 Editorial office of Acta Geologica Sinica (English edition), Geological Society of China, Beijing 100037, China*

Separation technology of rare earth elements (REEs), as the critical step in the separation process, had long been fraught with technical difficulty. A research project conducted by Baotou Shibo Rare Earth Extraction & Equipment Co. Ltd., Baotou REE Research Institute, and Baotou Steel & REE Group Hi-Tech Co. Ltd (Inner Mongolia), has successfully solved the problem using a centrifugal extractor and advanced techniques to achieve a key breakthrough.

The key device of the whole production line contains CTL-500FB centrifugal extractors and digital flow system equipment. Employment of an automatic controlling system and its fully functional operation system, along with various supportive facilities, fulfils the separation processes for various rare earth materials. Compared with conventional box-type separation technology, this new approach significantly improves the stirring intensity, thus improving production effectiveness and process capacity. Under the condition of the same production output, the amounts of extractant and feedstock used are greatly reduced, as is the loss of aqueous solution in the extractant. A short balance time (a single-level balance takes only 30 seconds) reduces the influence of startup and shutdown over production. Full closure of the production system removes the loss of volatiles in the diluents, in turn reducing consumption and significantly improving the production environment. Reduced operation steps lead to lower operation costs.

The production line relies heavily on a centrifugal extraction production line, which can process 5000 tons of carbonate-type REE feedstock per year, and a REE recovery production line, which can process 3000 tons of Nd–Fe–B-bearing

waste per year. This has offered many high-quality products such as REO, fluoride and carbonate, etc. After the three-year-round operation, the new type of production line has proved reliable in technique and equipment, and all specifications have attained the international advanced level.