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## Extraction of rare earth elements from the natural and man-made raw by using supercritical carbon dioxide

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In connection with the development of modern high-tech industries and changing market conditions in the last few years have seen a growing interest in rare-earth elements (REE). This necessitates the creation of new technologies for processing of mineral raw materials, as well as various industrial wastes and secondary resources. Virtually all fields of REE are part of complex ores, incorporating a wide range of components. In this context a crucial role in the development of deposits, processing of ores and other sources play an extraction and sorption methods are widely used for the extraction, separation and purification of individual REE.

In this paper proposed the use of supercritical fluid extraction method for the isolation and separation of REE, uranium and thorium in the processing of mineral raw materials and industrial waste such as monazite concentrate and phosphogypsum. On the example of organophosphorus reagents such as TBP, CMPO, TOPO, and nitrogen-containing ligands DMDOGEMA and TODGA, as well as TBP-HNO<sub>3</sub> adduct we studied the possibility of sorption of REE by the previously synthesized solid phase extractants, based on carbon nanotubes and polystyrene Taunit media.

There was a fundamental possibility of separation of REE, uranium and thorium, the above extractants and their allocation to individual phases using supercritical carbon dioxide. A scheme for the processing of monazite concentrate and phosphogypsum.

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