

Rare Earth Element Potential in Kaolin Deposits

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Summary

Four kaolin deposits in the Bohemian Massif were studied in order to assess the potential for the recovery of rare earth elements (REE) as by-products from the residue after extraction and refining of the raw kaolin. The behaviour of REE+Y during kaolinitization was found to be largely a function of pre-alteration mineralogy. In the examples studied, i.e. granite-derived deposits of Kriechbaum (Austria) and Božičany, and arkose-derived deposits of Kaznějov and Podbořany (all Czech Republic), the REE+Y are predominantly hosted by monazite which has remained unaffected by kaolinitization. The overall REE+Y content of the variably kaolinitized rocks is strongly dependent on their genesis. While ion-adsorption plays an only minor role in the concentration of REE+Y in the studied kaolinitized rocks, the processing and refining of the raw kaolin leads to residues that are enriched in REE+Y by a factor of up to 40. The use of a magnetic separator and a hydrocyclone in the processing of the raw material can yield REE+Y contents of as much as 0.77 wt%. Although this value compares well with the REE+Y concentration in some potentially economic REE+Y-projects elsewhere, the overall tonnage of the (REE+Y) enriched residue is by far not sufficient to consider economic extraction of REE+Y as by-product. Our results are most probably applicable also to other kaolin deposits derived from the weathering of Hercynian basement granites elsewhere (e.g. in Saxonia and Bavaria, Germany). Overall, the potential for REE+Y production as by-product from kaolin mining has to be regarded as minimal.

Publications:

Höhn, S., Frimmel, H.E., Pasava, J., 2014, The rare earth element potential of kaolin deposits in the Bohemian Massif (Czech Republic, Austria). *Mineral. Deposita*, 49, in press.