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NATURAL AND SYNTHETIC APATITES AS SORBENTS FOR Cd^{2+} IONS FROM AQUEOUS SOLUTIONS

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The sorption of cadmium ions on synthetic apatites as well as on natural apatite minerals was studied in aqueous solutions with Cd^{2+} ions concentrations 1–3 mmol/L. Different fractions of Kola apatite, Estonian and Israel phosphorites were used. In order to determine the factors influencing apatite Cd-binding capacity, the sorption was investigated on synthetic calcium fluorcarbonateapatites with different specific surface area (12–113 m^2/g), fluorine (0–3.2% F), and carbonate (0.1–5% CO_2) content. The specific surface area of apatite minerals was in the range 0.2–22 m^2/g .

The greatest effect on cadmium binding capacity of an apatite has its specific surface area. The influences of anionic substitutions on binding capacity are smaller: The sorption of cadmium decreases with an increase in carbonate content; in fluorapatites the maximum cadmium sorption capacity appears when F/Ca molar ratio in apatite is in the range 0.06–0.1. The binding capacities of studied natural apatite minerals were in the range 0.2–22 mmol Cd^{2+} per 100 g apatite, and for synthetic apatites 10–70 mmol Cd^{2+} per 100 g apatite.

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