

## OBTAINING OF COMPLEX MINERAL FERTILIZER BY PHOSPHOGYPSUM CONVERSION WITH AMMONIUM NITRATE

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**Abstract.** The paper proposes an environmentally friendly method for phosphogypsum processing in aqueous media. A liquid complex mineral fertilizer was obtained by treating phosphogypsum with an ammonium nitrate solution. The dependences of the content of  $\text{Ca}^{2+}$ ,  $\text{SO}_4^{2-}$ ,  $\text{NO}_3^-$  in the temperature range of 293–353 K at the ratio  $\text{CaSO}_4:\text{NH}_4\text{NO}_3 = 1:0.5$  were established. It was shown, that the maximum dehydration temperature of calcium sulphate at which it is possible to convert phosphogypsum with an aqueous solution of ammonium nitrate, corresponds to 403 K. The optimal temperature for the fertilizer obtaining is 333 K. A complex liquid NSCa-fertilizer with the content of nutrients N:Ca:S= 24:8:12 was obtained. This fertilizer increases the yield of radish by 7.16% compared to the control. The advantage of the proposed method is reducing the cost of the fertilizer, increasing its nutritional value, and obtaining useful products from waste.

**Keywords:** phosphogypsum, ammonium nitrate, liquid fertilizer, wet conversion, radish.