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Chemical Interaction of Copper Sulfate with Calcium Dihydrophosphate

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CHEMICAL INTERACTION OF COPPER SULFATE WITH CALCIUM DIHYDROPHOSPHATE

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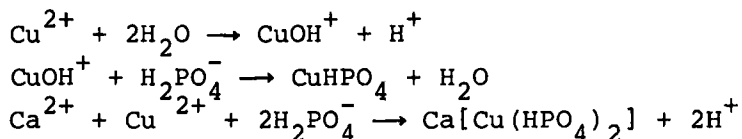
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In the course of manufacture of fertilizers containing micronutrients complicated multicomponent systems are formed. The chemical composition of the formed compounds is dependent on the stage of introduction and the sources of trace elements.

Interaction of copper sulfate with calcium dihydrophosphate in the manufacturing processes of phosphate fertilizers having copper additives was studied by means of chemical, potentiometric, IR-spectroscopic and X-ray diffraction methods.

The processes were carried out at 25°C. Fixed amounts of calcium dihydrophosphate were fed into the solution of copper sulfate. The mole fraction of copper in the solution varied from 0.03 to 0.5.

The pH value of the system was found to diminish from 5.5-4.1 to 3.3-1.75, which indicates the occurrence of the following reactions:



In the case of an excess of calcium ions in the reaction system the process of the formation of double salts like $\text{Ca}[\text{Cu}(\text{H}_2\text{PO}_4)_4]$ predominates. The composition of the solid phase is determined by the pH value at precipitation and depends on the ratio of the components in the initial composition. The formation of water-soluble double phosphates of calcium and copper guarantees a good availability of macro- and micronutrients in the fertilizers.