Synthesis of Thermodynamically Stable Ferrates (VI) in their Solid State

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Alkaline ferrates (VI) are known as strong oxidizing environmentally safe, coagulation and disinfecting compounds that can be successfully applied in the processing and purification of different kinds of water [1]. In aqueous solution, alkaline ferrates (VI) are thermodynamically unstable and are suitable for use only in the place of production. To expand the scope of their practical application there is a need for synthesis of ferrates (VI) in their solid state, which in a dry atmosphere may be stable for a long time.

This paper shows an efficient and relatively simple process of synthesis BaFeO₄ and Ag₂FeO₄ high purity in their solid state. The process of synthesis of Ag and Ba ferrates (VI) in their solid state is based on the reaction of salts or hydroxides Ba or Ag with electrochemically synthesized potassium ferrate (VI) in alkaline solution [2, 3]. The chemical reaction is very fast and takes place with the stoichiometric relation with the yield higher than 95%. The verification of the composition of the obtained salts and BaFeO₄ and Ag₂FeO₄ was performed by using X-ray diffraction on the powder on a diffractometer Philips PW 1710. The obtained X-ray diffraction diagrams show great conformity with literature data for BaFeO₄ and Ag₂FeO₄. Synthesized ferrates (VI) are far more stable than alkaline ones and can be stored for a much longer period of time. The resulting ferrates (VI) can be efficiently used in wastewater treatment processes of different origin for the breakdown of harmful and hazardous substances. They can be used as effective oxidizing agents in synthesis of organic compounds and as the active cathode materials in chemical current sources.

KEYWORDS: wastewater, environmental resources, alkaline ferrates (VI), barium ferrate(VI), silver ferrate(VI).

REFERENCES:


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