

Title (en)
METAL PHOSPHATES AND PROCESS FOR THE PREPARATION THEREOF

Title (de)
METALLPHOSPHATE UND VERFAHREN ZU DEREN HERSTELLUNG

Title (fr)
MÉTALLOPHOSPHATES ET LEUR PROCÉDÉ DE PRODUCTION

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Application
EP 12813366 A 20121221

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Abstract (en)
[origin: CA2848964A1] Process for preparing a monometallic or mixed-metallic phosphate of the type $(M1\ M2\ M3...Mx)_3(PO_4)_2 \cdot a\ H_2O$ where $0 = a = 9$, where $(M1, M2, M3... Mx)$ represents the one metal of the monometallic phosphate or the plurality of metals of the mixed-metallic phosphate and is/are selected from among Mn, Fe, Co, Ni, Sc, Ti, V, Cr, Cu, Zn, Be, Mg, Ca, Sr, Ba, Al, Zr, Hf, Re, Ru, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu, with the proviso that at least one of the metals in the phosphate is selected from among Mn, Fe, Co and Ni, where the process is characterized in that a) an aqueous solution (I) which contains at least one or more of the metals Mn, Fe, Co and/or Ni as divalent cations by introducing oxidic metal(II), metal(III) and/or metal(IV) compounds or mixtures thereof or compounds having mixed oxidation states selected from among hydroxides, oxides, oxide hydroxides, oxide hydrates, carbonates and hydroxide carbonates of at least one of the metals Mn, Fe, Co and/or Ni together with the elemental forms or alloys of at least one of the metals Mn, Fe, Co and/or Ni into an aqueous medium containing phosphoric acid and reacting the oxidic metal compounds with the elemental forms or alloys of the metals (in a redox reaction) to form the divalent metal ions, b) separating any solids present from the aqueous solution (I) containing phosphoric acid, c) when the phosphate is a mixed-metallic phosphate and the aqueous solution contains further metals selected from among $(M1, M2, M3... Mx)$ in addition to the metals introduced into the solution in step a), at least one compound of at least one of the metals $(M1, M2, M3... Mx)$ is also added in the form of an aqueous solution or as solid in the form of a salt to the aqueous solution (I), where the at least one compound is preferably selected from among hydroxides, oxides, oxide hydroxides, oxide hydrates, carbonates, hydroxide carbonates, carboxylates, sulphates, chlorides and nitrates of the metals, d) providing an initial charge solution (II) having a pH of from 5 to 8 produced from an aqueous phosphoric acid solution by neutralization with an aqueous alkali metal hydroxide solution or produced from an aqueous solution of one or more alkali metal phosphates, e) adding the aqueous solution (I) to the initial charge solution (II) and at the same time adding a basic aqueous alkali metal hydroxide solution in such a way that the pH of the resulting reaction mixture is kept in the range from 5 to 8, preferably from 6 to 7, resulting in precipitation of the phosphate of the type $(M1\ M2\ M3...Mx)_3(PO_4)_2 \cdot a\ H_2O$, and separating the precipitated phosphate from the reaction solution.

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