

Title (en)

AN ELECTROCHEMICAL PROCESS FOR PRODUCING NANOPARTICLES OF CUPRATE HYDROXYCHLORIDES

Title (de)

ELEKTROCHEMISCHES VERFAHREN ZUR HERSTELLUNG VON NANOPARTIKELN VON CUPRAT-HYDROXYCHLORIDEN

Title (fr)

PROCÉDÉ ÉLECTROCHIMIQUE DE PRODUCTION DE NANOPARTICULES D'HYDROXYCHLORURES DE CUPRATE

Publication

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Application

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Priority

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Abstract (en)

[origin: EP3674445A1] The present invention relates to an electrochemical process for producing nanoparticles of mixed copper hydroxide-chloride compounds responding to the chemical formula $M_{x-4}Cu_{4-x}(OH)_yCl_z$ wherein M is one or more metal cations from the group comprising a divalent earth alkali metal cation, a divalent transition metal cation or a trivalent transition metal cation, and wherein $0 \leq x \leq 1$, $5.5 \leq y \leq 6.5$ and $1.5 \leq z \leq 3$, the method comprising the steps of (1) supplying to a cathode compartment of an electrochemical cell, wherein the cathode compartment comprises a catholyte and is equipped with a cathode comprising a gas diffusion electrode with a porous electrochemically active material, a liquid water based mixture containing dissolved therein Cl^- ions, at least one precursor salt containing the one or more metal cations M, and at least one Cu^{2+} precursor salt, wherein the ratio of the concentration of Cu^{2+} to M is smaller than 10:1, (2) adjusting the pH of the reaction mixture to a value between 2.0 and 6.0, (3) supplying an O_2 containing oxidant gas to the gas diffusion electrode, (4) subjecting the cathode to an electrochemical potential which is below the thermodynamic limit of O_2 reduction at the pH of the reaction mixture, (5) applying a potential to the gas diffusion electrode to cause reduction of the O_2 contained in the oxidant gas to one or more of the corresponding peroxide, OH^- , ionic and/or radical reactive O containing species, and isolating nanoparticles of $M_{x-4}Cu_{4-x}(OH)_yCl_z$.

IPC 8 full level

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