

Title (en)
ADSORBENT COMPRISING LAYERED DOUBLE HYDROXIDE AND ACTIVATED CARBON

Title (de)
ABSORPTIONSMITTEL MIT GESCHICHTETEM DOPPELHYDROXID UND AKTIVIERTER KOHLE

Title (fr)
ADSORBANT COMPRENANT UN HYDROXYDE DOUBLE LAMELLAIRE ET DU CHARBON ACTIF

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Abstract (en)
[origin: WO2018046286A1] The present invention relates to a material that absorbs volatile compounds, in particular sulphurous compounds. It is found that an adsorbent of high surface area suitable for highly volatile compounds can be obtained by growing nanoparticles of a layered double hydroxide (LDH) on the surface of powder activated carbon (PAC). Disclosed is a composite adsorbent comprising nanoparticles of a layered double hydroxide (LDH) and a powder activated carbon (PAC) of the general formula $[M2+_{1-x}M3+_x(OH)_2]^{q+}(Xn-)_{q/n}.yH_2O$, in which, $M2+ = Ca^{2+}, Mg^{2+}, Mn^{2+}, Fe^{2+}, CO^{2+}, Ni^{2+}, Cu^{2+}$ or Zn^{2+} ; $M3+ = Al^{3+}$ or Fe^{3+} ; $x = [M3+]/[M3+ + M2+]$; $q = x \cdot n = 1$ to 4 ; and, $y =$ number of water molecules present on the LDH; $X =$ anions selected from halides, sulphates, nitrates, carbonates or anionic moiety from organic sources wherein said composite is obtainable by a hydrothermal process comprising, in sequence, the steps of: (a) contacting, and mixing, powder activated carbon with a water soluble salt of $M2+$ and a water soluble salt of $M3+$; (b) adding an alkali to the dispersion of step (a); (c) aging the dispersion of step (b) by heating it to 80 to $100\text{ }^{\circ}C$; (d) separating, by any means, the aqueous phase of the dispersion from the dispersed phase; and (e) washing said dispersed phase with water to remove excess alkali, to get the composite adsorbent, wherein amount of nanoparticles of said layered double hydroxide (LDH) is 10 to 30% by weight and wherein particle size of said powder activated carbon is $50\text{ }\mu m$ to $500\text{ }\mu m$.

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