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Adsorption of antipyrine by activated carbons from $FeCl_3$-activation of Tara gum (Article)

Bedia, J.[a], Belver, C.[a], Ponce, S.[b], Rodriguez, J.[c], Rodriguez, J.J.[a]

[a]Sección de Ingeniería Química, Facultad de Ciencias, Universidad Autónoma de Madrid, C/ Francisco Tomas y Valiente 7, Madrid, 28924, Spain
[b] Universidad de Lima, Av. Javier Prado Este s/n, Monterrico, Lima, 33, Peru
[c]Facultad de Ciencias, Universidad Nacional de Ingeniería, P.O. Box 31-139, Av. Túpac Amaru 210, Lima, Peru

Abstract

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Activated carbons were synthesized by $FeCl_3$-activation of Tara gum at different temperatures (400–1000 °C). The activating agent and the precursor were physically mixed at different ratios (r = $FeCl_3$:precursor, 0.5–3.0 wt). At r = 2 and 800 °C the most developed porosity was achieved, with a BET surface area of 1680 $m^2 \cdot g^{-1}$ and a pore volume near 1 $cm^3 \cdot g^{-1}$, corresponding mostly to micropores (≈75%). The carbons were fully characterized and tested for the aqueous-phase adsorption of antipyrine, used as model emerging pollutant. The kinetic curves and adsorption isotherms at 20, 40 and 60 °C were obtained, which fitted well to hyperbolic and Langmuir equations, respectively. At 20 °C, the saturation adsorption capacity was around 275 $mg \cdot g^{-1}$ AC. The free energy of adsorption varied from –40.2 to –35.7 $kJ \cdot mol^{-1}$, while values close to –3 $kJ \cdot mol^{-1}$ and 112 $J \cdot mol^{-1} \cdot K^{-1}$, were obtained for the enthalpy and entropy of adsorption, respectively.

SciVal Topic Prominence

Topic: Drug | Drug products | Pharmaceutical compounds

Prominence percentile: 99.966

Metrics

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Cited by 18 documents

Insights into the pyrolysis behavior and adsorption properties of activated carbon from waste cotton textiles by FeCl3-activation

Xu, Z. , Sun, Z. , Zhou, Y.
(2019) Colloids and Surfaces A: Physicochemical and Engineering Aspects

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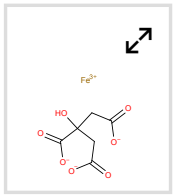
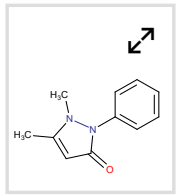
Chemistry database information

Substances

Author keywords

Activated carbon | Activation temperature | Adsorption | Antipyrine | $FeCl_3$ activation | Tara gum

Indexed keywords

Engineering controlled terms: Activated carbon | Carbon | Chemical activation | Chlorine compounds | Free energy | Iron compounds

Engineering uncontrolled terms: Activation temperatures | Antipyrine | Aqueous-phase adsorption | Emerging pollutants | Entropy of adsorption | Free energy of adsorption | Saturation Adsorption | Tara gums

Engineering main heading: Adsorption

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Bedia, J.; Sección de Ingeniería Química, Facultad de Ciencias, Universidad Autónoma de Madrid, C/ Francisco Tomas y Valiente 7, Madrid, Spain; email:jorge.bedia@uam.es