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Cellulose Microfibrils Obtained from Agro-Industrial Tara Waste for Dye Adsorption in Water (Article)

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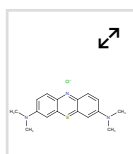
Abstract

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Microfibrils of cellulose were extracted from tara residues (TR), obtained after the production process, and used to remove dyes in aqueous solution. *Caesalpinia spinosa* (Molina) Kuntze or Tara spinosa, commonly known as tara, is a thorny shrub native to Peru. For these purposes, tara residues (TR) from the production process are used to extract cellulose microfibrils (CMF). First, TR are treated in basic mediums; then, they are transferred to an acidic medium. Finally, they are ground in a cutting mill for a short period of time. Scanning electron microscopy was used to characterize CMF. Fibre sizes of approximately 10 µm in length and 300–500 nm in diameter were observed. The crystallinity index calculated from X-ray patterns was defined at 77%. Infrared spectroscopy showed that treating TR with chemical products produces TR delignification. The dye adsorption tests (basic yellow, basic blue 41, basic blue 9 and basic green 4) in water demonstrated that isotherms adjust to the Langmuir model, with maximum respective adsorption values of 43.6, 45.5, 75.0 and 112.2 mg.g⁻¹ for each dye. [Figure not available: see fulltext.] © 2020, Springer Nature Switzerland AG.

Chemistry database information

Substances



Author keywords

[Caesalpinia spinosa](#) [Dyes](#) [Microfibrils](#) [Tara](#) [Water](#)

Indexed keywords

Engineering controlled terms:

[Cellulose](#) [Crystallinity](#) [Delignification](#) [Dyes](#) [Infrared spectroscopy](#) [Microfibrils](#) [Scanning electron microscopy](#)

Engineering uncontrolled terms

[Acidic mediums](#) [Chemical products](#) [Crystallinity index](#) [Dye adsorption](#) [Langmuir models](#) [Production process](#) [Short periods](#) [X-ray patterns](#)

Engineering main heading:

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