Title: Valorization of orange industry residues to form a natural coagulant and adsorbent

Authors: Maya KEBAILI, Souad DJELLALI, Manelle RADJAI, Nadjib DROUICHE, Hakim LOUNICI

PII: S1226-086X(18)30148-5
DOI: https://doi.org/10.1016/j.jiec.2018.03.027
Reference: JIEC 3927

To appear in:

Received date: 17-11-2017
Revised date: 4-3-2018
Accepted date: 19-3-2018

Please cite this article as: Maya KEBAILI, Souad DJELLALI, Manelle RADJAI, Nadjib DROUICHE, Hakim LOUNICI, Valorization of orange industry residues to form a natural coagulant and adsorbent, Journal of Industrial and Engineering Chemistry https://doi.org/10.1016/j.jiec.2018.03.027

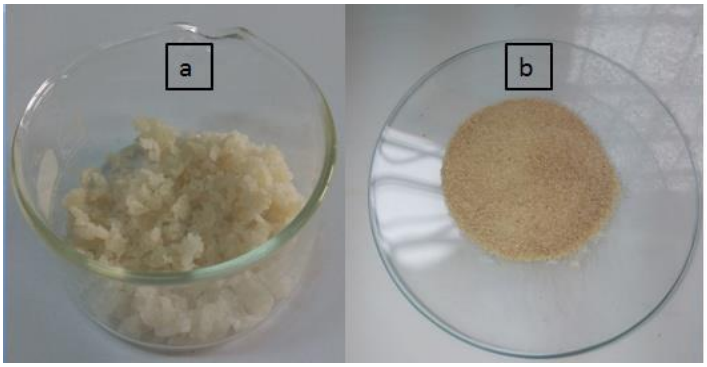

Figure 3: Pectin extract: a) Gel form, b) Powdered form

Abstract

The availability of by-products released as a result of the fruit processing development is a potential study area highlighting the possibility of valorizing them. This study presents an investigation on the valorization of orange juice factory pith and peel waste in terms of the recovering pectin and an adsorbent WT (Waste Treated) The recovered pectin was used in the removal of turbidity and the formed adsorbent was used for the removal of Methylene Blue (MB) and Indigo Carmine (IC) dyes. The pectin yield obtained under extraction conditions (pH 1.5, temperature 80-82 C and extraction time 60 min) was found to be 16.32% and presenting moisture contain 10%, an ash contains 2.28 and an esterification degree of 65.21. With a dose of 6 mg/l, pectin used alone was able to reduce about 99% of initial turbidity at pH 3 after 30 minutes of settling time. For the waste recovered after the extraction of the pectin, an absorbance of 70.5% of the MB is obtained compared to 16.34% for IC which shows that our support is perfect to eliminate the cationic dye. Hence, N'GAOUS factory orange waste can be valorized in water treatment as a natural coagulant and adsorbent for water treatment with low environmental risks.

Keywords: Adsorption, coagulation, food processing, environmental risks, orange juice.

Introduction