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## Data Article

Q1 Characterization, isotherm, and thermodynamic data for selective adsorption of Cr(VI) from aqueous solution by Indonesia (Ende-Flores) natural zeolite Cr(VI)-imprinted-poly(4-VP-co-EGDMA)-ANZ (IIP-ANZ)

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## ARTICLE INFO

## Article history:

Received 1 October 2017

Received in revised form

11 November 2017

Accepted 29 January 2018

## Keywords:

Natural zeolite

Imprinted-polymer

Selective adsorption

Hexavalent chromium

## ABSTRACT

In this paper, we report for the first time modification of Indonesia (Ende-Flores) natural zeolite Cr(VI)-imprinted-poly(4-VP-co-EGDMA)-ANZ (IIP-ANZ) as a selective adsorbent for Cr(VI) from aqueous solution. The IIP-ANZ was synthesized from Cr(VI) as a template, 4-vinylphiridine (4-VP) as complex agent and as functional monomer, ethylene glycol dimethyl acrylate (EGDMA) as a cross-linker agent, benzoyl peroxide (BPO) as initiator and ethanol/acetone as a porogen. The optimization adsorption parameters optimization such as adsorbent amount, initial pH of sample solution, contact time and temperature were studied. The maximum adsorption capacity was 4.210 mg/g adsorbent. The adsorption process follow Freundlich isotherm model. Under the competitive condition, the adsorption capacity of IIP-ANZ for Cr(VI) is higher than Pb(II), Mn(II), Ni(II) and Cr(III). Moreover, the reusability of the IIP-ANZ particle was tested for five times and no significant loss in adsorption capacity observed.

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<https://doi.org/10.1016/j.dib.2018.01.081>

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## Specifications Table

Subject area	<i>Chemical Engineering</i>
More specific subject area	<i>Adsorption</i>
Type of data	<i>Table, image, figure</i>
How data was acquired	<ul style="list-style-type: none"> <li>- <i>The uptake of Cr(VI) by the adsorbent (<math>q_e</math>) was determined based on the subtraction of the initial and final concentration of adsorbate</i></li> <li>- <i>Fourier transform infrared (FTIR) spectroscopy (Shimadzu, IRPrestige 21), scanning electron microscopy with energy dispersive X-ray (SEM-EDX) spectroscopy (JEOL, JMS 5600, Tokyo, Japan), X-ray diffraction (Shimadzu, XRD-6000), Quantachrome Instruments NOVA 1200 (High-Speed Gas Sorption Analyzer Versions 10.0–10.03) was used for determine the characteristics of the adsorbent</i></li> <li>- <i>The Cr(VI) concentration measurement was performed by UV-vis spectroscopy (Shimadzu, UV-1240)</i></li> </ul>
Data format	<i>Analyzed</i>
Experimental factors	<ul style="list-style-type: none"> <li>- <i>To synthesize Indonesia (Ende-Flores) natural zeolite Cr(VI)-imprinted-poly(4-VP-co-EGDMA)-ANZ (IIP-ANZ), the Cr(VI) was used as a template, 4-vinyl pyridine (4-VP) was used as complex, functional monomer, ethylene glycol dimethacrylate (EGDMA) as a cross linker, benzoyl peroxide (BPO) as initiator and acid were activated of Indonesia (Ende-Flores) natural zeolite (ANZ) as a host</i></li> <li>- <i>For comparison, NIP-ANZ (non-ion imprinted polymer) was also prepared using identical procedure without the addition of Cr(VI)</i></li> <li>- <i>Data of IIP-ANZ were acquired for Cr(VI) removal from aqueous solution</i></li> </ul>
Experimental features	<i>IIP-ANZ for Cr(VI) adsorption from aqueous solution</i>
Data source location	<i>Airlangga University, Surabaya, Indonesia</i>
Data accessibility	<i>Data are accessible with the article</i>

## Value of the data

- *The newly synthesized adsorbent has a good potential application in related of wastewater treatment or to use in solid phase extraction*
- *The isotherm and thermodynamic data will be informative and useful for predicting and modeling the adsorption capacity and mechanism of chromium removal by the adsorbent*
- *The acquired data will be advantageous for the scientific community wanting to scale up and design an adsorption column with IIP-ANZ as medium for the removal of Cr(VI)-containing waters or wastewaters*

## 1. Data

The XRD patterns of IIP-ANZ unleached, IIP-ANZ leached and NIP-ANZ are shown in Fig. 1. The FTIR of IIP-ANZ unleached, IIP-ANZ leached and NIP-ANZ at wave numbers from 400 to 4000  $\text{cm}^{-1}$  are given in Fig. 2. The results of the SEM-EDX analysis for IIP-ANZ unleached, IIP-ANZ leached and NIP-

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