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Data Article

Data of furfural adsorption on nano zero valent iron (NZVI) synthesized from Nettle extract

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ABSTRACT

Among various water and wastewater treatment methods, adsorption techniques are widely used to remove certain classes of pollutants due to its unique features. Thus, the aim of this data article is to synthesize zero valent iron nanoparticles (NZVI) from Nettle leaf extract by green synthesis method as an environmentally friendly technique, and to evaluate its efficiency in the removal of furfural from aqueous solutions. The data of possible adsorption mechanism and isotherm of furfural on the synthesized adsorbent are depicted in this data article. The data acquired showed that the adsorption trend follows the pseudo-second order kinetic model and that the Langmuir isotherm was suitable for correlation of equilibrium data with the maximum adsorption capacity of 454.4 mg/g. The information of initial furfural concentration, pH, adsorbent dosage and contact time effects on the removal efficiency are presented. Considering the findings data, the developed nanoparticle from Nettle leaf extract, as a low cost adsorbent, could be considered as promising adsorbent for furfural and probably similar organic pollutants removal from aqueous solutions.

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Specifications Table

Subject area	Environmental Engineering
More specific subject area	- Industrial effluent treatment - Wastewater technology
Type of data	Tables, Figures, Images and Text file
How data was acquired	- Nettle extract was used to synthesize novel nano zero-valent iron (NNZVI). - Batch experiments were performed to collect the data of the influence of contact time and pH on furfural removal. - Transmission electron microscopy (JEOL JEM 1200 EX Mk 2), Philips X'Pert Pro instrument (Netherlands), pH meter (Sense Ion 378, Hack), double beam spectrophotometer (Model lambda 25- Perkin Elmer Company) and Eppendorf versatile 5810 series centrifuge were used. - The obtained data were analyzed using appropriate equations and isotherm models.
Data format	Analyzed
Experimental factors	The data of effects of main experimental parameters including contact time and solution pH were acquired.
Experimental features	Adsorption of furfural from aqueous solutions using nano zero valent iron (NZVI) that prepared via green synthesis method from Nettle extract has been studied.
Data source location	Hamadan city, Hamadan province, Iran
Data accessibility	Data are available in article

Value of the data

- This data offer an environmentally friendly method for preparation of adsorbent from Nettle leaf extract.
- The removal of furfural from aqueous solution was examined using a synthesized novel green adsorbent.
- Data show that the developed adsorbent has high potential for the removal of furfural from aqueous solution.

1. Data

The Nettle leaf, as an abundant local plants in Ardabil province, northwestern Iran, used in this study to prepare zero-valent iron nanoparticles (NZVI). Transmission electron microscopy (TEM), and Philips X'Pert Pro instrument (the Netherlands) were used to get particle sizes and XRD patterns of the synthesized nanoparticles, respectively. The obtained data are shown in Fig. 1(a) and (b). The effects of contact time and solution pH on removal efficiency data are presented in Figs. 2 and 3. The kinetic and isotherm data are also shown in Tables 1 and 2.

2. Materials and methods

2.1. Materials

All chemicals used in the experiments were high purity analytical grade and purchased from Merck Co. Germany, and are used without further treatment. Aqueous solutions of furfural with

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