

PERSONAL INFORMATION

Ali Jabbar Salim Al-Darraj



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Sex Male | Date of birth 01/01/1982 | Nationality Iraqi

WORK EXPERIENCE

(May, 2007 – Present)

Lecturer at Al-Mustansiriya University

- Chemistry department, College of science, Al-Mustansiriya University / Iraq
- Teaching industrial chemistry for third and fourth undergraduate classes

EDUCATION AND TRAINING

(Oct. 2012)

M. Sc. Degree in Chemistry

- Graduation grade average of 79.5%
- Thesis: Polyaniline Nanofiber and nanocomposites: Preparation, Characterization and application in Cr(VI) and phosphate ion removal) under supervision of Prof. dr. Tariq Suhail Najim with 91% mark.

(July 2006)

B. Sc. Degree in Chemistry - Industrial Chemistry

- Graduation grade average of 76.98%

PERSONAL SKILLS

Mother tongue(s)

Arabic

Other language(s)

English

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	
B2	B2	B2	B2	B2

Communication skills

- Excellent communication skills gained during the years of studying and work.

Organisational / managerial skills

- I have organizational and managerial skills as I organised different activities before and have leadership skills

Digital competence

SELF-ASSESSMENT				
Information processing	Communication	Content creation	Safety	Problem solving
PROFICIENT USER	PROFICIENT USER	INDEPENDENT USER	INDEPENDENT USER	PROFICIENT USER

- Excellent command with dealing and using of Microsoft office (Word, Excel, PowerPoint)

Other skills

Replace with other relevant skills not already mentioned. Specify in what context they were acquired.
Example:

- carpentry

ADDITIONAL INFORMATION

Publications

- "SYNTHESIS AND CHARACTERIZE NEW HETEROCYCLIC COMPOUNDS DERIVATIVES FROM DIAZONIUM SALT DERIVATIVES" World Journal of Pharmaceutical and Life Sciences, 2016, Vol. 2, Issue 4, 353-361
- "Evaluation of removal study of pb (II) from aqueous solution onto polyaniline nanocomposite (prepared in situ by oxidative polymerization of aniline in presence of natural Bentonite)" International Journal of Applied Chemistry. ISSN 0973-1792 Volume 12, Number 2 (2016) pp. 157-174.
- "Formulation and Evaluation of Controlled Release"Cefixime-CMC Biopolymer" using Ion Cross Linking Technique" 14(2), 2016, 874-890. International Journal of Chemical Sciences.Indian Journal.
- Adsorption of Hexavalent Chromium Ion from Aqueous Solution by Sodium Alginate and Carboxymethyl Cellulose Beads: Kinetics and Isotherm studies. Journal of Al-Nahrain University vol.18,(4),2015 ,pp.40-48
- Polyaniline nanofibers and nanocomposites: Preparation, characterization, and application for Cr(VI) and phosphate ions removal from aqueous solution Arabian Journal of Chemistry-2104

Different activities

- A member of the Iraqi Association for Nano Technology
- Participation in the XRF and XRD –workshop 2013 held by Physics Department at the University of Sulaimani ,on October 2nd -3rd ,2013
- Participation in Conference 2012 of Cleantech in USA, Titel the pepar " Preparation and Characterization of polyaniline nanofiber and nanocomposites and their application in removal of Cr(VI) and phosphate" (Cleantech 2012,www.ct-si.org,ISBN 978-1-4665-6277-6)

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Evaluation of removal study of pb (II) from aqueous solution onto polyaniline nanocomposite (prepared in situ by oxidative polymerization of aniline in presence of natural Bentonite)

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Chemistry Department-Mustansiriyah University-Baghdad-IRAQ

Abstract

Polyaniline (PANI) nanocomposites used as a removal surface of pb(II) from aqueous solution has been prepared. A PANI nanocomposite was obtained in situ by oxidative polymerization of aniline in acidic medium using ammonium persulphate as initiator in the presence of natural Bentonite at room temperature. The PANI nanofiber and nanocomposite were characterized by Fourier transform infrared spectroscopy (FTIR), X-ray diffraction (XRD) and Scanning Electron Microscope (SEM). The parameters such as pH, initial conc. of pb(II), contact time and PANI dosage affecting the removal of pb(II) from aqueous solution have been investigated. The studies of kinetic models including pseudo-first-order, pseudo-second-order, intraparticle diffusion and Elovich are performed. Langmuir, Freundlich and Temkin adsorption isotherm are investigated. Equilibrium data fitted the Freundlich adsorption isotherm. The thermodynamic parameters such as ΔG° , ΔH° and ΔS° are calculated. The positive value of ΔH° (18.17 KJmol⁻¹) indicated that the adsorption of pb (II) onto PANI nanocomposite was endothermic; The positive value of ΔS° (69.92 Jmol⁻¹k⁻¹) reveals good affinity of pb (II) ions towards PANI nanocomposite.

Keywords: Polyaniline nanocomposite, adsorption kinetic, adsorption isotherms and thermodynamic,

INTRODUCTION

The pollution of water by toxic compounds, heavy metal ions and dyes imposes ecological and public problem due to hazardous and irrecoverable effects of such pollutants on human health and the environment [1-3].

Adsorption of Hexavalent Chromium Ion from Aqueous Solution by Sodium Alginate and Carboxymethyl Cellulose Beads: Kinetics and Isotherm Studies

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Abstract

The removal of hexavalent chromium from aqueous solutions using biopolymeric beads of crosslinked sodium alginate (SA) and carboxymethyl cellulose (SCMC) as the adsorbent is reported in this paper. The biopolymeric alginate and carboxymethyl cellulose beads were prepared and characterized by FTIR spectra. The studies of adsorption of Cr(VI) were conducted by varying various parameters: such as contact time, pH, amount of adsorbent and concentration of adsorbate. A comparison of kinetic models applied to the adsorption of Cr(VI) ions on the adsorbents was evaluated for the pseudo-first-order, the pseudo second-order and intraparticle diffusion kinetic models respectively. Results show that the pseudo second-order kinetic model was found to correlate the experimental data well. The experimental equilibrium data were applied to Langmuir and Freundlich isotherm models and their equilibrium parameters were estimated.

Keywords: adsorption kinetic; carboxymethyl cellulose; sodium alginate.

Introduction

The heavy metal pollution is of great concern among the kinds of environmental pollution because of their high toxicity and other adverse effects on human health [1]. Heavy metals like chromium, copper, lead, zinc, mercury, cadmium etc. are present in waste water from several industries such as metal cleaning and plating baths, refineries, paper and pulp, tanning, dyes and pigments, wood preserving, glass, ceramic paints, catalysis chemical manufacturing etc. in which chromium (VI) is present from 5 to 220 mg/dm³ which leave into environment [2-3].

Chromium can be released to the environment through a large number of industrial operation. Including metal finishing industry, iron and steel industries and inorganic chemicals production. There are various methods to remove Cr(VI) including chemical precipitation, membrane process, ion exchange, liquid extraction and electro dialysis [4]. But most of these methods have many disadvantages including incomplete metal removal, use of expensive equipment, and higher energy consumption adsorption remain the most economical of toxic metal ions from waste water [5].


The biosorption is the passive, nonmetabolic process of binding various

chemicals on biomass, including physico-chemical interactions, adsorption and ion-exchange. In the case of biosorption, ion-exchange is the most important mechanism that is realized by interaction between metal ions and active groups present in biopolymers. Thus by immobilization of biomass in a polymeric matrix that yields beads or granules with optimum size, mechanical strength, rigidity and porosity characteristics, the efficient removal of metal ions can be carried out. [6] The research for high biomass sorption is expected to improve the potential for the introduction of new materials, which are likely to be competitive and cost efficient for the sorption of metals. One of the most widely studied naturally occurring biopolymers are polysaccharide based biosorbents such as alginate and carboxymethyl cellulose (CMC) which have binding sites for divalent cations due to the presence of various functional groups within them. [7].

Sodium carboxymethyl cellulose (SCMC) is an important biopolymer due to its high degree of solubility in water, biocompatible, nontoxic and low cost [8]. SCMC has been widely used as thickening agent and stabilizing agent in industrial field [9]. Alginates have been used extensively in the food, cosmetics, pharmaceutical and biomedical industries for their gel forming properties in the presence of

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ORIGINAL ARTICLE

Polyaniline nanofibers and nanocomposites: Preparation, characterization, and application for Cr(VI) and phosphate ions removal from aqueous solution

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KEYWORDS

Polyaniline nanofibers;
Nanocomposites;
Cr(VI) and phosphate;
Adsorption

Abstract Interfacial and rapid-mixing polymerization were used for preparation of polyaniline nanofiber (PANI). PANI nanocomposites were prepared by in situ oxidative polymerization of aniline in acidic medium using ammonium persulphate as initiator in the presence of natural silica (PANIS), acid treated natural silica (PANISA), fiber glass (PANIFG), and poly(ethylene terephthalate) powder from waste bottles (PANIPET). The pure PANI nanofibers and their nanocomposites were characterized by FTIR, X-ray diffraction (XRD) and Scanning Electron Microscope (SEM). The characteristic absorption bands of polyaniline nanofiber in pure polyaniline and nanocomposites were observed by FTIR. XRD also confirms the formation of PANI nanofiber, the SEM images have clearly shown the formation of pure PANI nanofiber alone and in the nanocomposites. The nanocomposites were used for removal of Cr(VI) and phosphate ion pollutants from aqueous solutions. The adsorption experiments reveal that PANISA nanocomposite was potential for removal of Cr(VI) and phosphate. PANISA nanocomposite takes less time to reach adsorption equilibrium and less amount of PANISA was needed to achieve maximum adsorption in comparison with other nanocomposites. This behavior was attributed to the large surface area, due to, increase in number of pores and channels in the structure of PANISA after treatment with acid. It was also found that the Pseudo-second-order kinetic model well represents the experimental data for all nanocomposites.

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1. Introduction

Polyaniline nanofiber has become one of the most attractive conducting polymers due to high stability, easy methods of synthesis, feasibility of electrical conductivity control by changing either the protonation state or the oxidation state

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SYNTHESIS AND CHARACTERIZE NEW HETEROCYCLIC
COMPOUNDS DERIVATIVES FROM DIAZONIUM SALT
DERIVATIVES

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ABSTRACT
Diazonium salts^[1,2] were synthesized by the reaction of salicylaldehyde with different primary amine. And then refluxed compounds^[1,2] with appropriate amine to form Schiff Bases derivatives.^[3-6] New derivatives of β -lactam^[7-10] were synthesized by the reaction of Schiff Bases derivatives^[3-6] with chloroacetyl chloride in presence triethylamine. Then cyclization of compounds^[3-6] with mercapto acetic acid in presence dry benzene to give thiazolidenones derivatives.^[11-14] All synthesized compounds were characterized by measurement melting point, FT-IR spectral, Elemental Analysis and some of them by ¹H-NMR spectral.

KEYWORD: Diazonium salt, Schiff base, β -lactam, Thiazolidenone.

INTRODUCTION
Azo dyes compounds are contain Nitrogen-Nitrogen group as a characteristic chromophore, and mainly give in diazotization and coupling reaction. As per literature survey, it was occur that azo dyes have been most vastly used in variety application fields, such as dying textile fibres, biomedical studies and advanced in organic synthesis as well as shows different of attending biological activities consisting antibacterial and pesticide activities.^[1-5] azo dye compounds are recognized for their medicinal importance^[6-9], azo compounds are recognized to be related in a number of biological reactions illustrate inhibition of DNA, RNA and protein synthesis, carcinogenesis and nitrogen fixation.^[10]

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Preparation and characterization of polyaniline nanofiber and nanocomposites and their applications in removal of Cr(VI) and phosphate

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ABSTRACT

Polyaniline (PANI) nanofiber was prepared by interfacial and rapid-mixing polymerization. PANI nanocomposites were prepared by *in situ* oxidative polymerization of aniline in acidic medium using ammonium persulfate as initiator in the presence of natural silica (PANIS), acid treated natural silica (PANISA), fiber glass (PANIFG), and poly(ethylene terephthalate) powder from waste bottles (PANIPET). The nanocomposites were used for removal of Cr(VI) and phosphate from aqueous solution. The PANI nanofiber and nanocomposite were characterized by FTIR, XRD and SEM. FTIR and XRD confirm the formation of PANI nanofiber, the SEM images clearly shown the formation of PANI nanofiber alone or in the nanocomposites. The adsorption experiments reveal that PANISA nanocomposite is potential for removal of Cr(VI) and phosphate in comparison with other nanocomposites. This behavior is attributed to the large surface area, due to, increase in number of pores and channels in the structure of PANISA. It was also found that the Pseudo-second-order kinetic model well fitted with the experimental data for all nanocomposites.

Keywords: Polyaniline nanofiber, Nanocomposites, Cr(VI) and phosphate adsorption, Scanning Electron Microscope, Natural silica.

1 INTRODUCTION

PANI nanofibers have received much attention owing to their superior properties compared to the conventional bulk PANI [1-3]. PANI nanofibers show enhanced water processability [4] and improved sensitivity and time response when they are exposed to chemical vapour as they embody porous characteristic resulting in large surface area. On the other hand, PANI nanofibers have numerous applications, including electric devices and flash welding [5], sensors and actuators [6,7], and rechargeable batteries [8]. In this work, PANI nanofibers were synthesized via interfacial and rapid mixing polymerization of aniline as well as its nanocomposites with the following materials: natural silica (S), natural silica pretreated with acid (SA), glass fiber powder (GF), and poly(ethylene terephthalate) PET from waste bottles. The application of these nanocomposites for removal of Cr(VI) and phosphate ions from aqueous solution have been investigated. Kinetic of the adsorption process was also investigated.

2 EXPERIMENTAL

2.1 Materials and instruments

Ammonium peroxydisulfate (APS), hydrochloric acid, sodium hydroxide were of analytical grade and used as received, aniline was double distilled under vacuum, deionized water was used through out this work. Powdered PET was obtained by grinding of waste bottles in a small

grinder the particle size was about 500µm, washed several times with deionized water and acetone, then dried. Natural silica of particle size 150-200µm washed with deionized water and dried, acid treated natural silica SA was prepared by treating dried natural silica with 0.1M HCl for overnight then washed with deionized water and dried, fiber glass was grounded and treated with acetone for 3 h and dried. Water bath shaker type Lab. Companion BS-11, digital scale KERN-ABS, UV-visible spectrometer, CARY 100 Conc, pH meter type Trans BP 300, Scanning Electron Microscope (SEM) model Philips XL series 30, Shimadzu 8400 FTIR and Shimadzu-XRD 6000 were employed.

2.2 Preparation of PANI nanofiber

PANI nanofibers were prepared by two methods: interfacial and rapid mixing polymerizations [9]. In the former toluene was used as an organic phase, in which aniline was dissolved and aqueous phase containing ammonium APS and the doping acid (hydrochloric acid). The aniline was polymerized at the interface between the two phases. In the later method the polymerization were performed by rapidly mixing of two solutions, aniline in acidic deionized water and APS in acidic deionized water, into a beaker and the mixture was stirred moderately with a magnetic bar at 5-10°C. In both methods the polymerization were lasted for 3 h, the doped PANI was filtered and washed with plenty of distilled water then with ethanol and acetone to remove all unreacted aniline, oligomers and impurities, then dried.

2.3 Preparation of nanocomposites

The polyaniline nanofiber composites were prepared by *in situ* oxidative polymerization of aniline in the presence of S, SA, GF and PET in hydrochloric acid solution by rapid addition of a specified amount of APS in HCl to the mixture then moderately stirred using magnetic bar. After 3 h, the product was filtered and washed with distilled water then ethanol and acetone to remove unreacted aniline, oligomers and impurities then dried in an oven at 80°C for 6 h and stored in a sealed container.

2.4 Adsorption experiments

A stock solution of potassium dichromate and potassium dihydrogen phosphate of 1000 mg/l, were prepared. From this solution, dilute concentrations of Cr(VI) and phosphate were prepared by dilution of specified volume of stock solution. 50 ml of certain concentration of Cr(VI) and phosphate were stirred with certain amount of nanocomposite in a water bath shaker for definite time interval. At the end of each adsorption experiment the solution was made alkaline at pH \geq 12, and the residual



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FORMULATION AND EVALUATION OF CONTROLLED RELEASE CEFIXIME-CMC BIOPOLYMER USING ION CROSS LINKING TECHNIQUE

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ABSTRACT

The main concept in the design controlled-release drug delivery systems is the kinetics of drug release, rather than the kinetics of drug absorption controls the availability of the drug. The controlled release microspheres of cefixime using sodium carboxy methyl cellulose and $\text{FeCl}_3/\text{FeCl}_2$ as cross linking agent. The micro-beads were prepared using ionotropic gelatin technique. The prepared micro-beads were evaluated by *in vitro* drug release and Fourier transform infra red spectroscopy (FTIR). The evaluation of drug controlled release was performed at different pH (1.2 & 7.2) and different temperatures (27, 37, 45°C). The results were revealed that the drug releasing was increased with rising of temperatures and faster at pH equal to 7.2.

FTIR Spectroscopy was revealed that there is no chemical interaction between the drug and excipients. Korsmeyer-Peppas and Higuchi, zero and first order kinetic models was studied and discussed. Correlation coefficient (r^2) values of the kinetic release process suggest that the drug release obey Korsmeyer-Peppas kinetic model.

Key words: Cefixime, Sodium carboxymethyl cellulose, Kinetics, Drug release.

INTRODUCTION

Controlled drug delivery systems were broadly classified into temporal and targeted drug delivery systems^{1,2}. Temporal drug delivery systems were designed to release therapeutic levels of drugs from a matrix of desired period time. The advantage of such system was the therapeutic concentration of a drug maintained in the body for long time without repeatable times of administration. Furthermore, it is more economical due to lower drug waste, reproducible, and increase patient compliance³. The attempts to develop a novel

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