Preparation and characterization of chitosan-grafted-poly(2-amino-4,5-pentamethylene-thiophene-3-carboxylic acid N '-acryloyl-hydrazide) chelating resin for removal of Cu(II), Co(II) and Ni(II) metal ions from aqueous solutions

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Addison, AW (Addison, A. W.)[2];Abdel-Latif, DA (Abdel-Latif, D. A.)[1,2];
Monier, M (Monier, M.)[1,2]

Abstract
The graft copolymerization of ethylacrylate (EA) onto chitosan initiated by potassium persulphate and Mohr's salt combined redox initiator system in limited aqueous medium was carried out in heterogeneous media. Moreover, modification of the grafted chitosan was carried out by reaction of the ester group (-COOEt) with 2-amino-4,5-pentamethylene-thiophene-3-carboxylic acid hydrazide which eventually produce chitosan-grafted-poly(2-amino-4,5-pentamethylene-thiophene-3-carboxylic acid N'-acryloyl-hydrazide) (chitosan-g-ATAH) chelating resin. The application of the modified resin for metal ion uptake was studied using Cu(2+), Co(2+) and Ni(2+) ions. The modified chelating resins were characterized using FTIR spectroscopy, SEM and X-ray diffraction. (C) 2011 Published by Elsevier B.V.
Source: INTERNATIONAL JOURNAL OF BIOLOGICAL MACROMOLECULES Volume: 48 Issue: 4 Pages: 558-565 DOI:
Author Keywords: Chitosan; Grafting; Ethylacrylate; Aminothiophenecarboxylic acid hydrazide
KeyWords Plus: CROSS-LINKED CHITOSAN; COMPLEXING AGENT; COPPER(II) IONS; ADSORPTION; EQUILIBRIUM; KINETICS; EPICHLOROHYDRIN; BEADS; DYE
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Publisher: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS
Web of Science Categories: Biochemistry & Molecular Biology
Research Areas: Biochemistry & Molecular Biology
IDS Number: 753DO
ISSN: 0141-8130
References:

1- Title: Comparative adsorption of Cu(II), Zn(II), and Pb(II) ions in aqueous solution on the crosslinked chitosan with epichlorohydrin

Author(s): Chen, Arh-Hwang; Liu, Sheng-Chang; Chen, Chia-Yuan; et al.

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Author(s): Vasconcelos, Helder L.; Camargo, Tiago P.; Goncalves, Norberto S.; et al.

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Author(s): Zhou, Limin; Wang, Yiping; Liu, Zhirong; et al.

Source: JOURNAL OF HAZARDOUS MATERIALS Volume: 161 Issue: 2-3 Pages: 995-1002 DOI: 10.1016/j.jhazmat.2008.04.078 Published: JAN 30 2009

Theoretical and experimental investigation on the radial flow desiccant dehumidification bed

Awad, MM (Awad, M. M.); Ramy, A (Ramy K, A.); Hamed, AM (Hamed, A. M.);

Bekheit, MM (Bekheit, M. M.)

Abstract

In the present work, a theoretical and experimental investigation of the radial flow solid desiccant dehumidifier has been reported. In the experimental study, spherical particles of silica gel (indicating type) of 3 mm average diameter were used as the working desiccant in the dehumidifier. The bed under investigation was of radial flow and cylindrical shape. Five experimental test units of hollow cylindrical bed with different values of diameter ratio were used. For all units, the total mass of dry silica gel in the bed was nearly the same. In the theoretical part of this study, a mathematical model has been developed and its output results were compared with the experimental data. The effect of bed design parameters on the desiccant bed dynamic performance was discussed. Results show that for efficient operation of the hollow cylindrical bed, dehumidification period is limited to 15 min for the diameter ratio of 7.2. This period increases with decrease in air flow rate and bed diameter ratio. The increase in diameter ratio increases the pressure drop within the bed and rises the bed adsorption capacity for short operation periods. This analysis allows us to identify and quantify the energy losses in the air blowing system for the specified dehumidification capacity of the desiccant bed. (C) 2007 Elsevier Ltd. All rights reserved.

Source: APPLIED THERMAL ENGINEERING Volume: 28 Issue: 1 Pages: 75-85 DOI: 10.1016/j.applthermaleng.2006.12.018 Published: JAN 2008

Author Keywords: adsorption; desorption; silica gel; desiccant; dehumidification; packed bed

KeyWords Plus: GEL PACKED-BEDS; SILICA-GEL; MOISTURE TRANSPORT; MASS-TRANSFER; HEAT; ALUMINA

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Publisher: PERGAMON-ELSEVIER SCIENCE LTD, THE BOULEVARD, LANGFORD LANE, KIDLINGTON, OXFORD OX5 1GB, ENGLAND

Web of Science Categories: Thermodynamics; Energy & Fuels; Engineering, Mechanical; Mechanics

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Author(s): Niu, JL; Zhang, LZ

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Author(s): PESARAN, AA; MILLS, AF

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Publisher: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS

Web of Science Categories: Biochemistry & Molecular Biology

Research Areas: Biochemistry & Molecular Biology

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Author(s): Ngah, WSW; Kamari, A; Koay, Y

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Author(s): Unlu, Nuri; Ersoz, Mustafa

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Author(s): Vasconcelos, Helder L.; Camargo, Tiago P.; Goncalves, Norberto S.; et al.

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Author(s): Zhou, Limin; Wang, Yiping; Liu, Zhirong; et al.

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Theoretical and experimental investigation on the radial flow desiccant dehumidification bed

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Bekheit, MM (Bekheit, M. M.)

Abstract

In the present work, a theoretical and experimental investigation of the radial flow solid desiccant dehumidifier has been reported. In the experimental study, spherical particles of silica gel (indicating type) of 3 mm average diameter were used as the working desiccant in the dehumidifier. The bed under investigation was of radial flow and cylindrical shape. Five experimental test units of hollow cylindrical bed with different values of diameter ratio were used. For all units, the total mass of dry silica gel in the bed was nearly the same. In the theoretical part of this study, a mathematical model has been developed and its output results were compared with the experimental data. The effect of bed design parameters on the desiccant bed dynamic performance was discussed. Results show that for efficient operation of the hollow cylindrical bed, dehumidification period is limited to 15 min for the diameter ratio of 7.2. This period increases with decrease in air flow rate and bed diameter ratio. The increase in diameter ratio increases the pressure drop within the bed and rises the bed adsorption capacity for short operation periods. This analysis allows us to identify and quantify the energy losses in the air blowing system for the specified dehumidification capacity of the desiccant bed. (C) 2007 Elsevier Ltd. All rights reserved.

Source: APPLIED THERMAL ENGINEERING Volume: 28 Issue: 1 Pages: 75-85 DOI: 10.1016/j.applthermaleng.2006.12.018 Published: JAN 2008

Author Keywords: adsorption; desorption; silica gel; desiccant; dehumidification; packed bed

KeyWords Plus: GEL PACKED-BEDS; SILICA-GEL; MOISTURE TRANSPORT; MASS-TRANSFER; HEAT; ALUMINA

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Publisher: PERGAMON-ELSEVIER SCIENCE LTD, THE BOULEVARD, LANGFORD LANE, KIDLINGTON, OXFORD OX5 1GB, ENGLAND

Web of Science Categories: Thermodynamics; Energy & Fuels; Engineering, Mechanical; Mechanics

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Author(s): PESARAN, AA; MILLS, AF

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Mononuclear and polynuclear chelates of picolinoyldithiocarbazate

Rakha, TH (Rakha, TH); Bekheit, MM (Bekheit, MM)

Abstract

Mononuclear and polynuclear chelates of potassium picolinoyldithiocarbazate (KHPcDC) with Mn(II), Fe(III), Fe(II), Co(II), Ni(ll), Cu(II), Zn(II), Cd(II), Hg(II), Pd(II) and U(VI)O-2 have been prepared and characterized by chemical and thermal (TG, DTG, DTA) analyses, molar conductivities, spectral (UV-Visible, IR, NMR ESR) and magnetic moment measurements. The molar conductivities of the completes lie in the non-electrolyte range whilst KHPcDC is a 1 :1 electrolyte. Changes in selected vibrational absorption of the ligand upon coordination Indicate that KHPcDC behaves as monoanionic and coordinates in a bidentate, tridentate and/or bridging tetradentate manner. Trans-form structure is proposed far [Pd(HPcDC)(2)] . 2H(2)O and [Cd(HPcDC)(2)] complexes on the basis of NMR data. An octahedral structure is proposed for Fe(III), Fc(II) and Ni(II) complexes, a square-planar structure for Co(II) and Pd(II) complexes and a tetragonally distorted octahedral structure for the Cu(II) chelate on the basis of spectroscopic and magnetic data. The ligand field parameters (B, Dq, beta) for the Fe(III) and Ni(II) chelates were calculated. TG, DTG and DTA. studies support the different modes of chelation of I KHPcDC. The solid metal acetate chelates have a unique decomposition exotherm profile which can be used as a rapid and sensitive tool for the detection of acetate-containing complexes.

Source: CHEMICAL & PHARMACEUTICAL BULLETIN Volume: 48 Issue: 7 Pages: 914-919 Published: JUL 2000

Author Keywords: dithiocarbazate; coordination mode; transition metal; spectral; thermal

KeyWords Plus: TRANSITION-METAL COMPLEXES; DERIVATIVES; COPPER(II); THIOSEMICARBAZONES; NICKEL(II); BEHAVIOR; LIGAND; ACID; IONS

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Publisher: PHARMACEUTICAL SOC JAPAN, 2-12-15-201 SHIBUYA, SHIBUYA-KU, TOKYO, 150, JAPAN

Web of Science Categories: Chemistry, Medicinal; Chemistry, Multidisciplinary; Pharmacology & Pharmacy

Research Areas: Pharmacology & Pharmacy; Chemistry

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Author(s): AGGARWAL, RC; RAO, TR

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Author(s): AHUJA, IS; SINGH, R; RAI, CP

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Author(s): ALI, MA; LIVINGST.SE

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Author(s): BUUHOI, NP; LOC, TB; XUONG, ND

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Author(s): CAMPBELL, MJ; GRZESKOW.R

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Author(s): CRIM, JA; PETERING, HG

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Author(s): DAS M

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Author(s): ELSHAZLY, MF; ELDISSOWKY, A; SALEM, T; et al.

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Author(s): Mostafa, SI

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