

- 1 ALBAJI, A.; ZIARATI, P.; SHIRALIPOUR, R. Mercury and Lead Contamination Study of Drinking Water in Ahvaz, Iran. *International Journal of Farming and Allied Sciences*, v. 19, n. 2, p. 751-755, 2013.
- 2 ABDEL, O; NICOLAS, P.; GABRIEL, B.; PHILIPPE, R.; BAGHDAD, O. Environmental impacts of heavy metal discharges from a smelter in Deûle-canal sediments (Northern France): Concentration levels and chemical fractionation. *Water, air and soil pollution*, v. 180, p. 83-95, 2007.
- 3 HALEEM KHAN, M.; YASMIN, N. Study of Metallic Pollutants in Water and Food Items of an Industrial City by Atomic Absorption Spectrophotometry. *Pakistan Journal of Biological Sciences*, v. 6, n. 14, p. 1276-1281, 2003.
- 4 FU, F.; WANG, Q. Removal of heavy metal ions from wastewaters: A review. *Journal of Environmental Management*, v. 92, p. 407-418, 2011.
- 5 BARAKAT, M. A. New trends in removing heavy metals from industrial wastewater. *Arabian Journal of Chemistry*, v. 4, p. 361–377, 2011.
- 6 LEUNG, W.; WONG, M.F.; CHUA, H.; LO, W.; LEUNG, C.K. Removal and recovery of heavy metals by bacteria isolated from activated sludge treating industrial effluents and municipal wastewater. *Water Science & Technology*, v. 41, p. 233–240, 2000.
- 7 VOLESKY. Detoxification of metal-bearing effluents: biosorption for the next century. *Hydrometallurgy*, v. 59, p. 203–216, 2001.
- 8 PERMINOVA, I. V.; HATFIELD, K.; HERTKORN, (Eds.). **Use of Humic Substances to Remediate Polluted Environments: From**

- Theory to Practice.** Nato Science Series IV. ed. Russia: Springer and NATO PDD., v. 52, 2005.
- 9 STEVENSON, F. J. **Humus Chemistry: Genesis, Composition, Reactions.** 2. ed. New York: John Wiley & Sons, 1994.
 - 10 CAMPOS, M. L.; ALMEIDA, J. A.; SILVEIRA, C. B.; GATIBONI, L. C.; ALBUQUERQUE, J. A. Impactos no solo provocados pela mineração e depósito de rejeito de carvão mineral. **Ciências Agroveterinárias, Brazil**, v. 9, n. 2, p. 198-205, 2010.
 - 11 SURVEY, G. Coal-A Complex Natural Resources. **Geological Survey Circular**, U.S., n. 1143, 2003.
 - 12 AGÊNCIA NACIONAL DE ENERGIA ELÉTRICA. **Atlas de Energia Elétrica do Brasil.** In: ANEEL Parte III Fontes Não renováveis. 9 Carvão Mineral. 3ª Edição. ed. Brasília: TDA Comunicação, 2008. Cap. 3, p. 130-138.
 - 13 VEIT, B. Assim nasce uma riqueza: a trajetória do carvão na região carbonífera. Univerty of Texas: Alcance, 2008. 70 p.
 - 14 CARBONIFERA CATARINENSE LTDA. Reservas do carvão mineral no Brasil. Disponível em: <http://www.carboniferacatarinense.com.br/carvaomineral.php>. Acesso em: 01 Diciembre 2014.
 - 15 ASSOCIAÇÃO BRASILEIRA DE CARVÃO MINERAL. História do Carvão no Brasil. Carvão Mineral - Reservas, 2014. Disponível em: http://www.carvaomineral.com.br/interna_conteudo.php?i_subarea=8&i_area=4. Acesso em: 22-23 Novembro 2014.
 - 16 TROMPOWSKY, P. M. Synthesis and characterization of humic acid-liked substances from ecalypt charcol, and its interacion with diclorofenol, calcium, manganese and aluminum. Universidade Federal de Viçosa. Brazil. 2005.
 - 17 SANTOS, A; DA SILVA, J; MARIA DOS ANJOS, R; DE MELO BENITES, V; OLIVEIRA, S. Caracterização de ácidos húmicos produzidos a partir de carvão vegetal de duas espécies florestais do semi-árido. **Revista Verde de Agroecologia e Desenvolvimento Sustentável**, v. 4, n. 4, p. 01 - 11, Dezembro 2009. ISSN 1981-8203.

- 18 COSME, R. D. Obtenção de substâncias húmicas a partir do Rejeito de carvão Mineral: Métodos alternativos e caracterização. Pontifícia Universidade Católica de Rio de Janeiro. Rio de Janeiro. 2013.
- 19 NASSER, A.; EL-HENDAWY, A. Influence of HNO₃ oxidation on the structure and adsorptive properties of corncob-based activated carbon. **Carbon**, v. 41, n. 4, p. 713-722, 2003.
- 20 BINIAK, S.; PAKUŁA, M.; SZYMANSKI, G.S.; SWIATKOWSKI, A. Effect of Activated Carbon Surface Oxygen- and/or Nitrogen-Containing Groups on Adsorption of Copper(II) Ions from Aqueous Solution. **Langmuir**, v. 15, p. 6117-6122, 1999.
- 21 JIA, Y. F.; THOMAS, K. M. Adsorption of Cadmium Ions on Oxygen Surface Sites in Activated Carbon. **Langmuir**, v. 16, p. 1114-1122, September 2000.
- 22 SHIM, J. W.; PARK, S. J.; RYU, S. K. Effect of modification with HNO₃ and NaOH on metal adsorption by pitch-based activated carbon fibers. **Carbon**, v. 39, n. 11, p. 1635-1642, September 2001.
- 23 CHINGOMBE, P.; SAHA, B.; WAKEMAN, R. J. Surface modification and characterisation of a coal-based activated carbon. **Carbon**, v. 43, n. 15, p. 3132-3143, December 2005.
- 24 DICK, D. LEITE, A.; COSME, R.D.; BROCCHI, E. O efeito da nitração sobre a extração de substâncias húmicas a partir de carvão mineral. IV Congresso Brasileiro de Carvão Mineral, Gramado-RS, n. 583, Agosto 2013.
- 25 MADRONOVÁ, L. (Ed.). **Humic Acids from Raw Materials of the Czech Republic (Chemistry Research and Applications)**. New York: Nova Science Pub Inc, 2009.
- 26 BAKER, H.; KHALILI, F. A study of complexation thermodynamic of humic acid with cadmium (II) and zinc (II) by Schubert's ion-exchange method. **Analytica Chimica Acta**, v. 542, p. May, 2005.
- 27 JONES, M. N.; BRYAN, N. D. Colloidal properties of humic substances. *Advances in Colloid and Interface Science*, v. 78, p. 1-48, 1998.
- 28 BARROS, L.; RUMJANECK, V.; ALTOÉ, M.; VELLOSO, C. X.; PASQUALOTO, L. Caracterização química e espectroscópica de

- Ácidos húmicos e fúlvicos isolados da camada Superficial de latossolos Brasileiros. **Brasileira de Ciência do Solo**, Brasil, v. 33, p. 51-63, 2009.
- 29 SAITO, B.; SECKLER, M. M. Alkaline Extraction of Humic Substances From Peat Applied to Organic-Mineral Fertilizer Production. **Brazilian Journal of Chemical Engineering**, v. 31, n. 3, p. 675-682, September 2014.
- 30 TIPPING, E. Cambridge **Environmental Chemistry Series** (Book 12). 1. ed. Cambridge: Cambridge University Press, 2002
- 31 .ZULFIKAR, M. A. Effect of Temperature on Adsorption of Humic Acid from Peat Water onto Pyrophyllite. **International Journal of Chemical, Environmental & Biological Sciences**, Indonesia, v. 1, n. 1, p. 2320-2323, 2013.
- 32 ROJAS, J. C.; PÉREZ, J.; GARRALÓN, G.; PLAZA, F.; MORENO, B.; GÓMEZ, M.A. Humic acids removal by aerated spiral-wound ultrafiltration membrane combined with coagulation–hydraulic flocculation. **Desalination**, Spain, v. 266, n. 1-3, p. 128-133, January 2011.
- 33 ROSA, A. H.; ROCHA, J. C.; FURLAN, M. Substâncias húmicas de turfa: estudo dos parâmetros que influenciam no processo de extração alcalina. **Química Nova**, v. 23, n. 4, p. 472-476, July/August 2000.
- 34 BRYAN, N. D. ABRAHAMSEN, L.; EVANS, N.; WARWICK, P.; BUCKAU, G.; WENG, L.; VAN RIEMSDIJK, W. H. The effects of humic substances on the transport of radionuclides: Recent improvements in the prediction of behaviour and the understanding of mechanisms. **Applied Geochemistry**, v. 27, p. 378–389, 2012.
- 35 XING, B. Sorption of naphthalene and phenanthrene by soil humic acids. **Environmental Pollution**, v. 111, n. 2, p. 303–309, February 2001.
- 36 HAVELCOVÁ, M.; MIZERA, J.; SÝKOROVÁ, I.; PEKAŘ, M. Sorption of metal ions on lignite and the derived humic substances. **Hazardous Materials**, v. 161, n. 1, p. 559-564, January 2009.

- 37 DICK, D. MANGRICH, A. S.; MENEZES, S.C.; BETANIA,P. Chemical and Spectroscopical Characterization of Humic Acids from two South Brazilian Coals of Different Ranks. **Brazilian Chemical Society**, São Paulo, v. 13, n. 2, p. 177-182, January 2002. ISSN ISSN 0103-5053.
- 38 DICK, D. P.; GOMES, J.; ROSINHA, P. B. Caracterização de Substâncias Húmicas Extraídas de Solos e de Lodo Orgânico. **Brasileira de Ciência do Solo**, v. 22, p. 603-611, 1998.
- 39 TATZBER, M. STEMMER, M.; SPIEGEL, H.; KATZLBERGER, C.; HABERHAUER, G.; MENTLER, A.; GERZABEK, M. H. FTIR-spectroscopic characterization of humic acids and humin fractions obtained by advanced NaOH, Na₄P₂O₇, and Na₂CO₃ extraction procedures. **Journal of Plant Nutrition and Soil Science**, v. 170, p. 522–529, 2007.
- 40 ASING, J.; WONG, N. C.; LAU, S. Optimization of extraction method and characterization of humic acid derived from coals and composts. **Journal of Tropical Agriculture and Food Science acid derived from coals and composts**, v. 37, n. 2, p. 211– 223, 2009.
- 41 SENESI, N.; D'ORAZIO, V.; RICCA, G. Humic acids in the first generation of EUROSOLS. **Geoderma**, v. 116, p. 325– 344, 2003.
- 42 GAO, K.; PEARCE, J.; JONES, J.; TAYLOR, C. Interaction between peat,humic acid and aqueous metal ions. **Environmental Geochemistry and Health**, v. 21, n. 1, p. 13-26, March 1999.
- 43 BAGLIERI, A.; VINDROLA, D.; GENNARI, M.; NEGRE, M. Chemical and spectroscopic characterization of insoluble and soluble humic acid fractions at different pH values. **Chemical and Biological Technologies in Agriculture**, p. 1-9, 2014.
- 44 KURKOVÁ, M.; KLIKA, Z.; KLIKOVÁ, C.; HAVEL, J. Humic acids from oxidized coals I: Elemental composition, titration curves,heavy metals in HA samples, nuclear magnetic resonance spectra of HAs and infrared spectroscopy. **Chemosphere**, v. 54, p. 1237–1245, 2004.

- 45 CUNHA, T. Spectroscopy: Characterization of Humic Acids Isolated from Amazonian Dark Earth Soils (Terra Preta De Índio). In: , et al. Amazonian Dark Earths: Wim Sombroek's Vision. [S.l.]: **Springer**, 2009. Cap. 20, p. 363-372.
- 46 POSPÍŠILOVÁ, L.; FASUROVÁ, N. Spectroscopic Characteristics of Humic Acids Originated in Soils and Lignite. **Soil and Water Research**, v. 4, n. 4, p. 168–175, 2009.
- 47 CLAPP, C. E.; HAYES, M. H.; SWIFT, R. S. In: BECK, A. J., et al. Organic substances in soil and water. Natural constituents and their influences on contaminant behaviour. [S.l.]: **Royal Society of Chemistry, Cambridge**, 1993. p. 31.
- 48 SWIFT, R. S. In: **Humic Substances: In search of structure**. New York: Wiley, 1989. p. 450.
- 49 PICCOLO, A. Increased soil organic carbon sequestration through hydrophobic protection by humic substances. **Soil Biology & Biochemistry**, v. 34, p. 1839-1851, 2002.
- 50 BAKER, H.; KHALILI, F. Effects of pH and Temperature on the Interaction of Pb(II) with Azraq Humic Acid Studied with Schubert's Ion Exchange Method. **Annals of Environmental Science**, v. 1, p. 35-44, January 2007.
- 51 CEZÍKOVÁ, J.; KOZLER, J.; MADRONOVÁ, L.; NOVÁK, J.; JANOS, P. Humic acids from coals of the North-Bohemian coal field II: Metal-binding capacity under static conditions. **Reactive & Functional Polymers**, Czech Republic, v. 47, p. 111–118, 2001.
- 52 BENITES, V.; MENDOÇA, E.; SCHAEFER, C.; NOVOTNY, E.; LÁZARO, E.; KER, J. Properties of black soil humic acids from high altitude rocky complexes in Brazil. **Geoderma**, v. 127, n. 1-2, p. 104-113, Julio 2005.
- 53 PASQUALOTO, L.; SANTOS, G. D. A. (Eds.). **HUMOSFERA: Tratado preliminar sobre a química das substâncias húmicas**. 1. ed. Rio de Janeiro: CCTA / UENF, v. 1, 2005.
- 54 FRANCIOSO, O.; MONTECCHIO, D.; GIOACCHINI, P.; CIAVATTA, C. MONTECCHIO, D.; GIOACCHINI, P.; CIAVATTA, C. Thermal analysis (TG-DTA) and isotropic characterization (¹³C-¹⁵N) of

- humic acids from different origins. **Applied Geochemistry**, v. 20, p. 537-544, 2005.
- 55 ESTEVES, V. I.; DUARTE, A. C. Thermogravimetric properties of aquatic humic substances. **Marine Chemistry**, v. 63, p. 225–233, 1999.
- 56 DURUIBE, J. O.; OGWUEGBU, M. O. C.; EGWURUGWU, J. N. Heavy metal pollution and human biotoxic effects. **International Journal of Physical Sciences**, v. 2, n. 5, p. 112-118, May 2007.
- 57 AGÊNCIA NACIONAL DE ÁGUAS (ANA). **Relatório de Conjuntura dos Recursos Hídricos**, edição 2013, pág 89. Disponível em: <http://arquivos.ana.gov.br/institucional/spr/conjuntura/webSite_relatorioConjuntura/projeto/index.html>. Acesso em: Fevereiro 2015.
- 58 BABEL, S.; KURNIAWAN, T. A. Low-cost adsorbents for heavy metals uptake from contaminated water: a review. **Hazardous Materials, Thailand**, v. B97, p. 219-243, September 2003.
- 59 O'CONNELL, D. W.; BIRKINSHAW, C.; O'DWYER, T. F. Heavy metal adsorbents prepared from the modification of cellulose: A review. **Bioresource Technology**, v. 99, n. 15, p. 6709–6724, 2008.
- 60 ARGUN, E.; DURSUN, S. A new approach to modification of natural adsorbent for heavy metal adsorption. **Bioresource Technology**, v. 99, p. 2516–2527, 2008.
- 61 FOO, K. Y.; HAMEED, B. H. Review: Insights into the modeling of adsorption isotherm systems. **Chemical Engineering Journal**, v. 156, p. 2–10, 2010.
- 62 PEHLIVAN, E.; ARSLAN, G. Comparison of adsorption capacity of young brown coals and humic acids prepared from different coal mines in Anatolia. **Journal of Hazardous Materials**, Konya, v. B138, p. 401–408, 2006.
- 63 DE CAPITANI, E.; PAOLIELLO, M. M. B.; COSTA DE ALMEIDA, G. R. **Lead sources of human exposure in Brazil**. *Medicina (Ribeirão Preto)*, v. 42, n. 3, p. 311-318, 2009.

- 64 VERMA, R.; DWIVEDI, P. Heavy metal water pollution- A case study. **Recent Research in Science and Technology**, v. 5, n. 5, p. 98-99, 2013.
- 65 HALEEM KHAN, M. **Influence of humic acid on sorption of cadmium on montmorillonite: Adsorptive/ Desorptive Interaction Mechanism of Cadmium, Humic acid and Clay in Binary and Ternary System**. Germany: VDM Verlag Dr. Müller & Co. KG, 2010.
- 66 BHATTACHARYA, A. K.; VENKOBACHAR, C. REMOVAL OF CADMIUM (II) BY LOW COST ADSORBENTS. **Environmental Engineering**, v. 110, n. 1, p. 110-122, August 1984.
- 67 US - EPA. Environmental Quality Guidelines for Industrial/Facility Effluents. Disponível em: <http://www.unep.org/chemicalsandwaste/Portals/9/Lead_Cadmium/docs/submissions/Submis_GOV_GHA.pdf>. Acesso em: 23 January 2015.
- 68 RESOLUÇÃO CONAMA 430. Condições e padrões de lançamento de efluentes. MINISTÉRIO DO MEIO AMBIENTE - CONSELHO NACIONAL DO MEIO AMBIENTE, 2011.
- 69 BAILEY, S. E.; OLIN, J.; BRICKA, R.; ADRIAN, D. A review of potentially low-cost sorbents for heavy metals. **Water Research**, Great Britain, v. 33, n. 11, p. 2469-2479, October 1999.
- 70 MACHOVIČ, V.; MIZERA, J.; SÝKOROVÁ, I.; BORECKÁ, L. Ion-exchange properties of Czech oxidized coals. **Acta Montana**, v. 117, p. 15-26, 2000.
- 71 ERDOGAN, S.; BAYSAL, A.; AKBA, O.; HAMAMCI, C. Interaction of Metals with Humic Acid Isolated from Oxidized Coal. **Polish Journal of Environmental Studies**, Turkey, v. 16, n. 5, p. 671-675, April 2007.
- 72 MARTYNIUK, H.; WIŁECKOWSKA, J. Adsorption of metal ions on humic acids extracted from brown coals. **Fuel Processing Technology**, v. 84, n. 1-3, p. 23-36, November 2003.
- 73 WANG, Y.; XIAO, H.; WANG, F. Adsorption kinetics, isotherm, and thermodynamic studies of adsorption of pollutant from aqueous

- solutions onto humic acid. **Sciences in Cold and Arid Regions**, China, v. 1, n. 4, p. 372-379, February 2009.
- 74 PANDEY, A. K.; PANDEY, S. D.; MISRA, V. Stability constants of metal-humic acid complexes and its role in environmental detoxification. **Ectotoxicology and Environmntal Safety**, v. 47, p. 195-200, 2000.
- 75 PASQUALOTO, L.; ARAÚJO, G.; ALPANDE, A.; MARCOS, V. Adsorção de Cu^{2+} e Cd^{2+} em ácidos húmicos extraídos de resíduos orgânicos de origem urbana. **Ciência Rural**, Santa Maria, Brasil, v. 29, n. 1, p. 21-26, 1999.
- 76 COLES, C. A.; YONG, R. N. Humic acid preparation, properties and interactions with metals lead and cadmium. **Engineering Geology**, v. 85, p. 26–32, 2006.
- 77 KLUCÁKOVÁ, M.; OMELKA, L. Sorption of Metal Ions on Lignite and Humic Acids. **Chemical Papers**, v. 58, n. 3, p. 170-175, 2004.
- 78 ZHOU, P.; YAN, H.; GU, B. Competitive complexation of metal ions with humic substances. **Chemosphere**, v. 58, p. 1327–1337, 2005.
- 79 MANUNZA, B. ; DEIANA, S.; MADDAU, V.; GESSA, C.; SEEGER, R. **Stability Constants of Metal-Humate Complexes**: Titration Data Analyzed by Bimodal Gaussian Distribution. **Soil Science Society of America Journal**, v. 59, n. 6, p. 1570-1574, November 1995.
- 80 LANDONIN, D. V.; MARGOLINA, A. Interaction between humic acids and heavy metals. **Eurasian Soil Science**, Moscou, v. 30, n. 7, p. 710-715, 1997.
- 81 ORSETTI, S. et al. Pb(II) Binding to Humic Substances: An Equilibrium and Spectroscopic Study. **Enviromental Science & Technology**, v. 47, p. 8325–8333, 2013.
- 82 HUAMÁN, G. Biossorção de Metais Pesados Utilizando Pó da Casca de Coco Verde (Cocos nucifera). Dissertação de mestrado. Puc Rio. 2005.
- 83 MYERS,. **Surfaces, Interfaces, and Colloids: Principles and Applications**. Second. ed. New York: John Wiley & Sons, Inc., 1999.

- 84 CHRISTMANN, K. IMPRS-Lecture Series: Thermodynamics and Kinetics of Adsorption: Experimental and Theoretical Methods in Surface Science. Institut für Chemie und Biochemie - Freie Universität Berlin. Berlin, p. 58. 2012.
- 85 YILDIRIM ERBIL, H. **Solid Surface. In: Surface Chemistry of Solid and Liquid Interfaces**. India: Blackwell Publishing, v. 1, 2006. Cap. 3, p. 295-302.
- 86 HO, Y.-S. Review of second-order models for adsorption systems. Hazardous Materials, Taiwan, v. B136, p. 681- 689, August 2006.
- 87 LINHARES, L. A. et al. Application of Langmuir and Freundlich models of the adsorption of cadmium and lead in different classes of Brazilian soils. **Revista Tecnológica**, Brasil, v. 17, p. 49-60, 2008.
- 88 HO, Y.-S. Selection of optimum sorption isotherm. **Carbon**, v. 42, n. 10, p. 2115-2116, March 2004.
- 89 REDLICH, O.; PETERSON, D. L. A Useful Adsorption Isotherm. **Physical Chemistry**, v. 63, n. 6, p. 1024-1024, June 1959.
- 90 AZIZIAN, S. Kinetic models of sorption: a theoretical analysis. **Colloid and Interface Science**, v. 276, n. 1, p. 47-52, August 2004.
- 91 HO, Y.-S.; OFAMAJA, A. E. Kinetics and thermodynamics of lead ion sorption on palm kernel fibre from aqueous solution. **Process Biochemistry**, v. 40, n. 3455–3461, November 2005.
- 92 HO, Y.-S.; MCKAY, G. Pseudo-Second order model for sorption processes. **Process Biochemistry**, v. 34, n. 5, p. 451-465, July 1999.
- 93 ZHAO, G.; WU, X.; TAN, X.; WANG, X. Sorption of Heavy Metal Ions from Aqueous Solutions: A Review. **The Open Colloid Science**, China, v. 4, p. 19-31, 2011.
- 94 Wu, P.; Zhang, Q.; Dai, Y.; Zhu, N.; Dang, Z.; Li, P. Adsorption of Cu(II), Cd(II) and Cr(III) ions from aqueous solutions on humic acid modified Ca-Montmorillonite. **Geoderma**, v. 164, p. 215–219, 2011.
- 95 SHAKER, M. A.; ALBISHRI, H. M. Dynamics and thermodynamics of toxic metals adsorption onto soil-extracted humic acid. **Chemosphere**, v. 111, p. 587–595, 2014.

- 96 HO, Y. S.; MCKAY, G. The kinetics of sorption of divalent metal ions onto sphagnum moss peat. **Water Research**, Great Britain, v. 34, n. 3, p. 735-742, May 2000.
- 97 HO, Y. S.; WASE, D. A. J.; FORSTER, C. F. Removal of lead ions from aqueous solution using sphagnum moss peat as absorbent. **Water SA**, United Kingdom, v. 22, n. 3, p. 219-224, 1996.
- 98 NAMASIVAYAM, C.; KAVITHA, D. Adsorptive Removal of 2,4-Dichlorophenol from Aqueous Solution by Low-Cost Carbon from an Agricultural Solid Waste: Coconut Coir Pith. **Separation Science and Technology**, v. 39, n. 6, p. 1407-1425, 2005.
- 99 KRISHNAN, K. A.; SHEELA, A.; ANIRUDHAN, T. Kinetic and equilibrium modeling of liquid-phase adsorption of lead and lead chelates on activated carbons. **Chemical Technology and Biotechnology**, v. 78, p. 642-653, 2003.
- 100 KALLIAT, T. V. **Equilibrium Adsorption Isotherms at Interfaces. In: Elements of Environmental Engineering: Thermodynamics and Kinetics**. Third Edition. ed. [S.I.]: CRC Press, 2009. p. 90.
- 101 CRINI, BADOT. **Wastewater Treatment by sorption** CHAPTER 2: Sorption Processes and Pollution: Conventional and Non-conventional Sorbents for Pollutant Removal from Wastewaters. [S.I.]: Presses Univ. Franche-Comté, 2010. p. 71-72.
- 102 UNUABONAH, E. I.; ADEBOWALE, K.O.; OLU-OWOLABI, B.I.; YANG, L.Z.; KONG, L.X. Adsorption of Pb (II) and Cd (II) from aqueous solutions onto sodium tetraborate-modified Kaolinite clay: Equilibrium and thermodynamic studies. **Hydrometallurgy**, v. 93, p. 1–9, 2008.
- 103 KALKREUTH, W.; HOLZ, M; MEXIAS, A; BALBINOT, M; LEVANDOWSKI, J; WILLETT, J; FINKELMAN, R; BURGER, H. Depositional setting, petrology and chemistry of Permian coals from the Paraná Basin: 2. South Santa Catarina Coalfield, Brazil. **Coal Geology**, Germany, v. 84, p. 213-236, December 2010.
- 104 TROMPOWSKY, P.; BENITES, V.; EMOKE, B.; SANTOS, A.; HOCKADAY, W.; HATCHER, P. Characterization of humic like

- substances obtained by chemical oxidation of eucalyptus charcoal. **Organic Geochemistry**, n. 36, p. 1480-1489, 2005. ISSN ISBN.
- 105 INTERNATIONAL HUMIC SUBSTANCES SOCIETY. Isolation of IHSS SAMPLES, 2007. Disponível em: <<http://www.humicsubstances.org/>>. Acesso em: 16-23 December 2013.
- 106 BRUNETTI, G. PLAZA, C.; CLAPP, C.E.; SENESI, N. Compositional and functional features of humic acids from organic amendments and amended soils in Minnesota, USA. **Soil Biology and Biochemistry**, USA, v. 39, n. 6, p. 1335-1365, June 2007.
- 107 SIONG, S.; SENG, L.; CHONG, W.; ASING, J.; FAIZAL, M.; SATIRAWATY, A. Characterization of the Coal Derived Humic Acids from Mukah, Sarawak as Soil Conditioner. **Journal of the Brazilian Chemical Society**, v. 17, n. 3, p. 582-587, 2006.
- 108 SHURYGINA .; LARINA, N.K.; CHUBAROVA, M.A.; KONONOVA, M.M.. Differential thermal analysis (dta) and thermogravimetry (TG) of soil humus substances, moscow, v. 6, p. 169-177, december 1971.
- 109 HUTAF BAKER, F. K. Analysis of the removal of lead(II) from aqueous solutions by adsorption onto insolubilized humic acid: temperature and pH dependence. **Analytica Chimica Acta**, v. 516, n. 1-2, p. 179–186, July 2004.
- 110 NASIR, S.; TAHIRA B.; VERHEYEN, T. VINCENT; CHAFFEE, A.L. Structural elucidation of humic acids extracted from Pakistani lignite using spectroscopic and thermal degradative techniques. **Fuel Processing Technology**, v. 92, p. 983–991, 2011.
- 111 SKHONDE, M. P.; HEROD, A.A.; VAN DER WALT, T.J.; TSATSI, W.L.; MOKOENA, K. The effect of thermal treatment on the compositional structure of humic acids extracted from South African bituminous coal. **International journal of mineral processing**, v. 81, p. 51–57, 2006.
- 112 ORSETTI, S.; QUIROGA, M. D. L. M.; ESTELA MARÍA, A. Binding of Pb(II) in the system humic acid/goethite at acidic pH. **Chemosphere**, v. 65, p. 2313–2321, 2006.

- 113 SARI, A.; TUZEN, M.; CITAK, D.; SOYLAK, M. Equilibrium, kinetic and thermodynamic studies of adsorption of Pb(II) from aqueous solution onto Turkish kaolinite clay. **Journal of Hazardous Materials**, v. 149, p. 283–291, 2007.
- 114 DAWODU, F. A.; AKPOMIE, G. K.; EJIKEME, P. C. Equilibrium, Thermodynamic and Kinetic Studies on the Adsorption of lead(II) from Solution by “Agbani Clay”. **Research Journal of Engineering Sciences**, v. 1(6), p. 2278 – 9472, December 2012.
- 115 HIEMENZ, P. C. The Electrical Double Layer and Double-Layer Interactions. In: **Principles of colloid and surface chemistry**. Third Edition. ed. New York: Marcel Dekker, Inc., 1997. Cap. 11, p. 514.
- 116 CAPRIEL, P. Hydrophobicity of organic matter in arable soils: influence of management. **European Journal of Soil Science**, v. 48, p. 457- 462, September 1997.