



REMOVAL OF NICKEL FROM AQUEOUS SOLUTION BY NORDMANN FIR (*ABIES NORDMANNIANA* (STEV.) SPACH SUBSP. *NORDMANNIANA*) CONES

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Abstract

Biosorption an alternative process is the uptake of heavy metals from aqueous solutions by biological materials. The biosorption of nickel ions from aqueous solution was investigated by Nordmann fir (*Abies nordmanniana* (Stev.) Spach. subsp. *nordmanniana*) in a batch adsorption system as a function of pH, initial metal concentration, biomass dosage, contact time. The data showed that the maximum pH for efficient sorption of Ni(II) was 6.5. At the optimal conditions, Ni(II) ion biosorption was decreased as the initial metal concentration increased. The results demonstrated that the biosorbent dosage strongly affected the amount of metal removed from aqueous solution. The biosorption process was very fast; 90% of biosorption occurred within 5 min and equilibrium was reached at around 60 min. Freundlich and Langmuir adsorption isotherm models, which are in common use for describing sorption equilibrium for wastewater-treatment applications, were used for mathematical description of the biosorption equilibrium data, both models were found to exhibit good fits to the experimental data.

Key words: biosorption, isotherm, Nordmann fir, nickel

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