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Optimization Study of Adsorption of Nickel(II) on Bentonite

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Abstract : This work concerns with the experimental study of the adsorption of the Ni(II) on bentonite. The effects of various parameters such as contact time, stirring rate, initial concentration of Ni(II), masse of clay, initial pH of aqueous solution and temperature on the adsorption yield, were carried out. The study of the effect of the ionic strength on the yield of adsorption was examined by the identification and the quantification of the present chemical species in the aqueous phase containing the metallic ion Ni(II). The adsorbed species were investigated by a calculation program using CHEAQS V. L20.1 in order to determine the relation between the percentages of the adsorbed species and the adsorption yield. The optimization process was carried out using 2³ factorial designs. The individual and combined effects of three process parameters, i.e. initial Ni(II) concentration in aqueous solution (2.10^{−3} and 5.10^{−3} mol/L), initial pH of the solution (2 and 6.5), and mass of bentonite (0.03 and 0.3 g) on Ni(II) adsorption, were studied.

Keywords : adsorption, bentonite, factorial design, Nickel(II)
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