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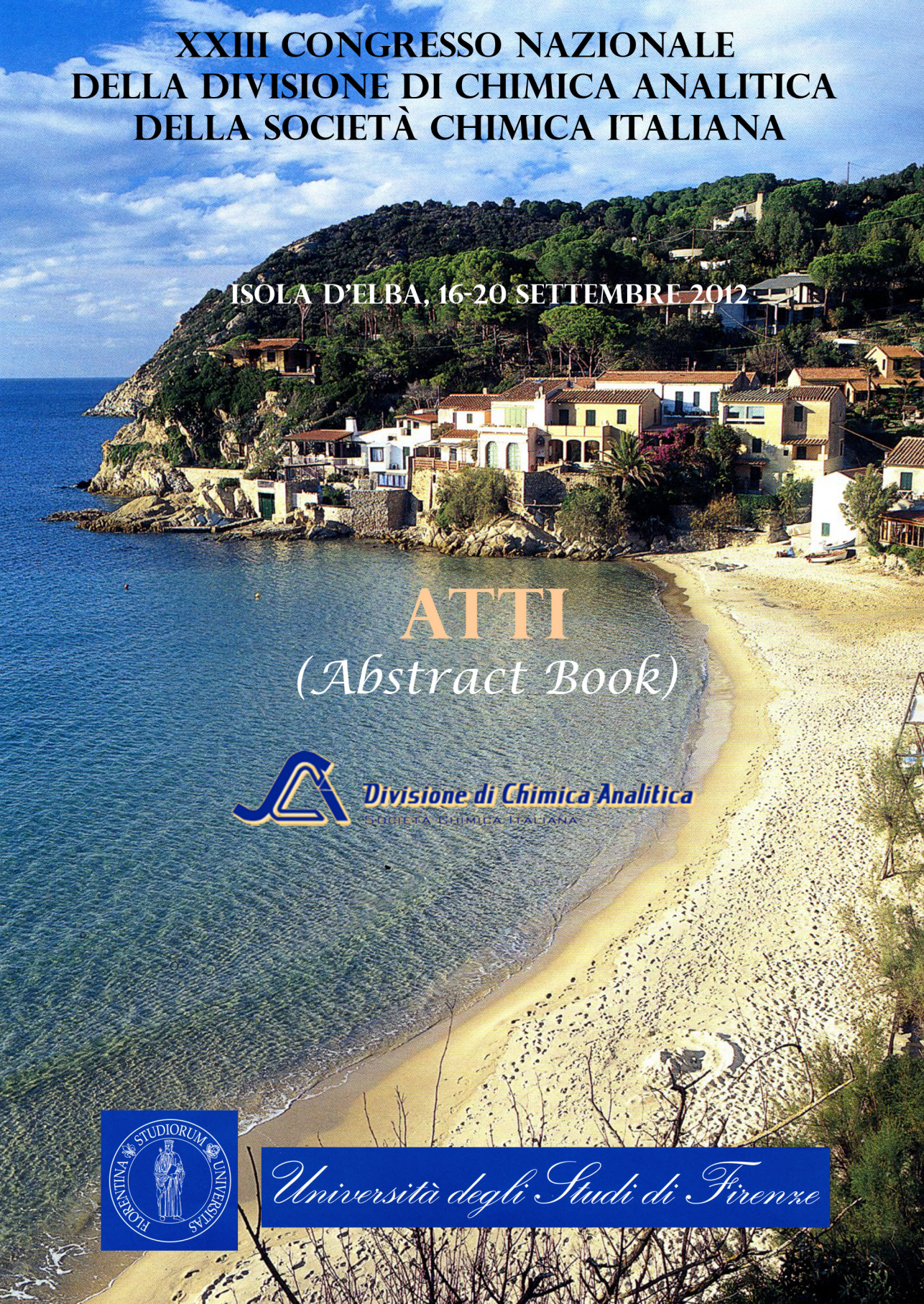
ISOLA D'ELBA, 16-20 SETTEMBRE 2012



ATTI

(Abstract Book)

Divisione di Chimica Analitica
Società Chimica Italiana

FLORENTINA STUDIORUM UNIVERSITAS

Università degli Studi di Firenze

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SORPTION OF CD^{2+} AND CU^{2+} IONS FROM AQUEOUS SOLUTIONS BY ALGINATE AND ALGINATE/PECTIN GEL BEADS

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Removal of toxic metal ions from natural waters, wastewaters and contaminated sites is of great importance for the health of living organism and for environmental protection (1). Alternatively to the conventional chemical treatments, such as precipitation, reverse osmosis, etc, that are expensive and of high environmental impact, the use of low cost and environmental friendly sorbent materials is a very promising new technology for meal ions removal (2,3). The most investigated sorbent materials are of organic origin derived from the natural biomass (algae, fungi, bacteria) and from industrial processes, such as wood, agriculture, fishery, textile manufacturing, etc. Also some inorganic materials (zeolites, clays, etc.) are used for the same purpose (4). All these sorbent materials show characteristics of low cost, low environmental impact, high degradability, great availability and high sorption capacity towards metal ions. The sorption ability of these materials is strictly related to their chemical composition containing high percentages of macromolecules with a great number of functional binding groups (-O, -N, and -S donors). Here we report results from an investigation carried out to remove cadmium(II) and copper(II) from aqueous solutions using alginate and pectin in gel phase. Both these materials are able to form hydrogels in the presence of small amounts of divalent cations, especially calcium ion. In this study we report equilibrium and kinetic investigations on biosorption of Cd(II) and Cu(II) from aqueous solutions by alginate and alginate/pectin gel beads. Batch kinetic measurements performed by varying the type of metal and the composition of the spherules at pH value near to 5 in order to avoid the hydrolysis processes of Cd(II) and Cu(II) showed that the sorption follows a pseudo second-order kinetic model and the sorption rate increases with pectin concentration in the gel beads. The equilibrium data were fitted by using both Langmuir and Freundlich isotherm models and a comparison was made among results obtained.

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