



УНИВЕРЗИТЕТ У НОВОМ САДУ
UNIVERSITY OF NOVI SAD

TOP ACHIEVEMENTS 2022

FACULTY OF TECHNOLOGY

Registered patent at the national level (No. 63737) -
Raspberry stem as a biosorbent for the removal of
chromium from aqueous solutions in the batch adsorption
process

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The invention represents particles of the ground dry stem of the Willamette raspberry variety, which is produced in large quantities as waste in raspberry cultivation and burned since it has no further use. However, this waste can be used to remove hexavalent chromium ions from aqueous solutions by biosorption.

Biosorbent (particles of the ground dry raspberry stem) was characterized by determining the chemical composition, specific surface area, distribution of pore sizes and mean pore diameter, the content of carboxylic and aldehyde groups, moisture content, as well as surface chemistry and crystallinity index of different fractions of raspberry stem particles, and adsorption characteristics by investigation of the influence of time and initial concentration of chromium(VI) ions on the adsorption capacity of different fractions of dry raspberry stem particles (105-224, 224-400 and 400-600 μm).

Results showed that the adsorption of chromium ions is fast during the first 30 minutes for the two smaller fractions, while the adsorption on the largest fraction is somewhat slower and with a lower capacity. Also, the equilibrium of adsorption on the smallest fraction was reached after 60 minutes, on medium-sized particles after 90 minutes, while it took 3 hours for the largest fraction to reach the equilibrium. Fractions of 105-224 and 224-400 μm showed removal efficiency in the range of 85.0 to 96.8% for initial concentrations of 10-100 mg/l. The highest efficiency was achieved at an initial concentration of 50 mg/l and it was 96.8 and 95.8%, for fractions of 105-224 and 224-400, respectively.

