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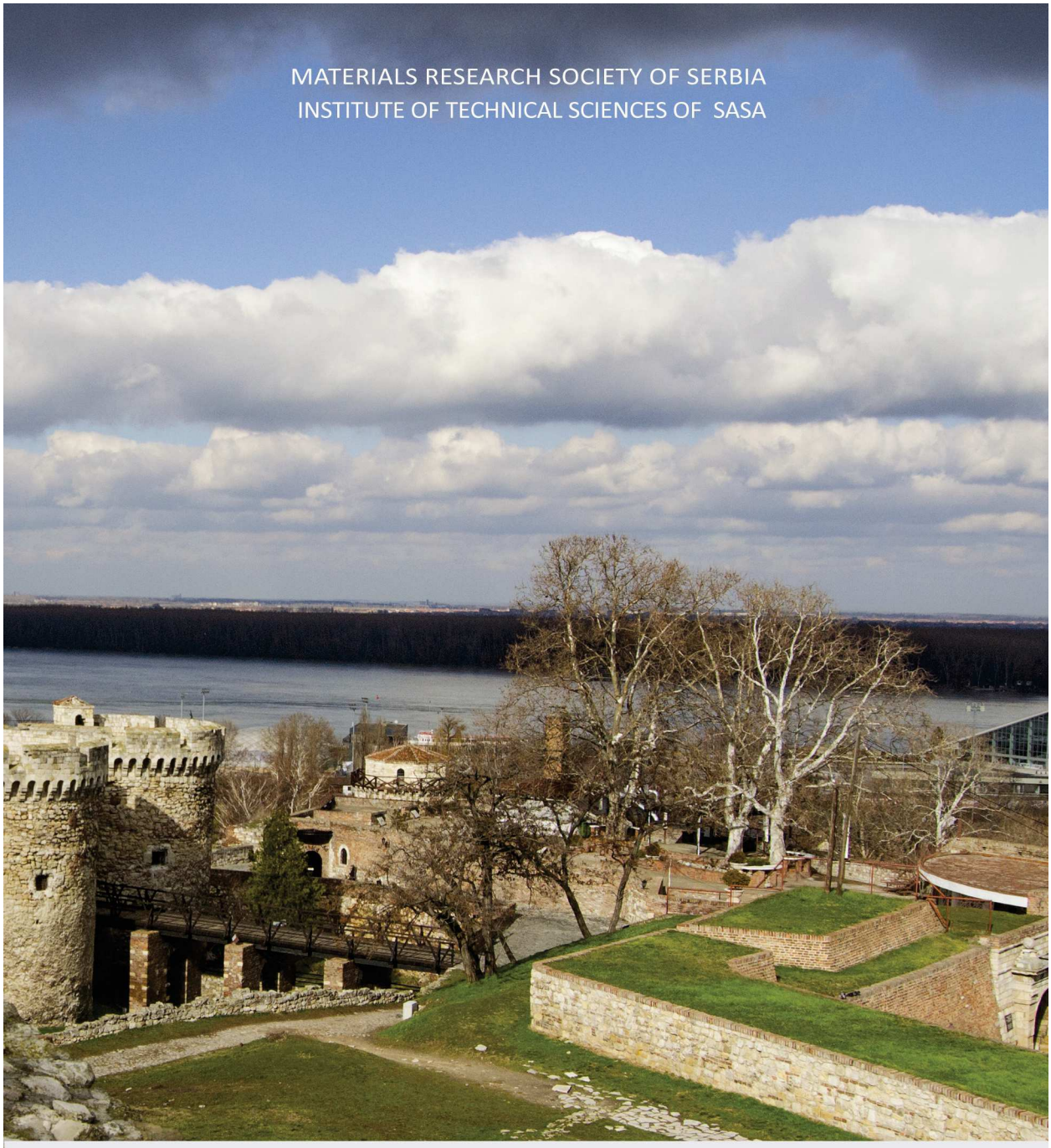

Programme and the Book of Abstracts

EIGHTEENTH YOUNG RESEARCHERS' CONFERENCE
MATERIALS SCIENCE AND ENGINEERING

Belgrade, December 4–6, 2019

http://www.mrs-serbia.org.rs/index.php/young-researchers-conference

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Biosorption of Cu^{2+} from aqueous solution by alkali modified waste jute woven fabrics

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Waste jute fabrics (raw and alkali modified), acquired as waste from different industries were used as an efficient biosorbent for removal of Cu^{2+} ions from aqueous solution. All woven jute fabrics (raw as well as alkali modified) were characterized by determination of their chemical composition and amount of carboxyl groups. The effect of solution pH, contact time and initial metal ion concentration on the biosorption were studied. The alkali modifications lead to hemicelluloses removal and an increased amount of carboxyl groups. The maximum biosorption capacity for Cu^{2+} was observed at pH 5.5. Concerning the contact time, more than 80% of total Cu^{2+} uptake by the raw jute fabric was removed within 1 h. On the other hand, in the case of alkali modified jute fabrics, between 70-75% of the total Cu^{2+} uptake was removed within 3 h. Increased initial ion concentration from 10 to 20 mg/l caused an increase in the total uptake capacity of alkali modified jute fabrics for 42-55%. It was found that the biosorption properties of waste jute fabrics are predominantly influenced by the amount of carboxyl groups, while fabric chemical composition (i.e. hemicelluloses content) has a secondary role in the biosorption of Cu^{2+} ions. The best biosorption performance possesses alkali modified jute fabric with 58% higher amount of carboxyl groups; its total uptake capacity towards Cu^{2+} ions (at 20 mg/l) is about 2 times higher compared to the raw jute fabric.

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