



10th Jubilee

RAD

INTERNATIONAL
CONFERENCE
ON RADIATION
IN VARIOUS FIELDS
OF RESEARCH

Spring Edition

June 13-17, 2022
Hunguest Hotel Sun Resort
Herceg Novi, Montenegro

**BOOK OF
ABSTRACTS**

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BOOK OF ABSTRACTS

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Cross-linked bio/inorganically modified urea-formaldehyde resins: Influence of γ -radiation on formaldehyde content

Mirjana Ristić¹, Suzana Samaržija-Jovanović¹, Vojislav Jovanović¹, Branka Petković¹, Marija Kostić², Tijana Jovanović³, Gordana Marković⁴, Milena Marinović-Cincović⁵

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The effect of γ -irradiation on hydrolytic stability of nano-silica, nano-titania, and wood flour (WF) modified urea-formaldehyde (UF) resins was investigated. Modified UF resin with wood flour (*Pinus silvestris* L.) as natural filler and modified UF resin with a mixture of SiO₂/WF and TiO₂/WF fillers were synthesized. A total of five samples were synthesized, with the designations UF/SiO₂, UF/TiO₂, UF/WF, UF/SiO₂/WF, and UF/TiO₂/WF, under the same conditions. The content of free formaldehyde (FA) was determined by the bisulfite method. The hydrolytic stability of modified UF resin was determined by measuring the concentration of liberated FA of modified UF resins after acid hydrolysis. The studied modified UF resins have been irradiated with 50 kGy and the effect of γ -irradiation was evaluated on the basis of the percentage liberated FA before and after γ -irradiation. The minimum percentage of free FA (0.06%) and liberated FA (0.16%) were obtained in UF/TiO₂ composite before and after γ -irradiation which indicates a significant improvement in the hydrolytic stability compared to other modified UF resins.

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