



Serbian Chemical Society
Serbian Young Chemists' Club



Eight Conference of the Young Chemists of Serbia

Book of Abstracts

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Tel./fax: +381 11 3370 467; www.shd.org.rs; office@shd.org.rs

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Dušan **SLADIĆ**, president of Serbian Chemical Society

Editors

Jelena **MILOVANOVIĆ**

Marko **RODIĆ**

Vuk **FILIPOVIĆ**

Života **SELAKOVIĆ**

Jelena **KESIĆ**

Mila **LAZOVIĆ**

Mihajlo **JAKANOVSKI**

Page Layout and Design

Vuk **FILIPOVIĆ**

Jelena **KESIĆ**

Mila **LAZOVIĆ**

Mihajlo **JAKANOVSKI**

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Poster presentations

Analytical chemistry

Investigation of clofazimine acid-base supersolubilization using various weak organic acids

Igor A. Topalović¹, Olivera S. Marković², Miloš P. Pešić¹, Tatjana Ž. Verbić¹

¹ University of Belgrade, Faculty of Chemistry, Belgrade, Serbia

² University of Belgrade, Institute of Chemistry, Technology and Metallurgy, National Institute of the Republic of Serbia, Belgrade, Serbia

Nowadays, more than two-thirds of potential drugs currently being discovered are practically insoluble in water with solubility $<100 \mu\text{g/mL}$. Despite that, compounds with even lower solubility ($<0.1 \mu\text{g/mL}$) are commonly selected for further development which is very challenging, especially in the pharmaceutical formulation process¹. Clofazimine (CFZ), an anti-leprosy drug with inhibitory activity against several coronaviruses, has a favourable safety profile², but it is poorly soluble in aqueous media. Hence, it is important to develop a method for increasing its solubility. In this work, a relatively novel approach of enhancing solubility of weakly basic drugs by using weak acids that would not form salts with the drug (acid-base supersolubilization (ABS)) has been applied. CFZ aqueous solubility was determined in solutions of tartaric, citric, malic, malonic or maleic acid: in set I acid solutions had the same concentration (2.5 mol/L), and in the set II they were scaled to the same pH (1.0). The drug was added in stirred acid solution until a precipitate was noticed and, after filtration, CFZ concentration in samples was determined by HPLC. Based on set I, it was found that the solubility of CFZ had the highest value in the case of tartaric acid (0.46 mg/mL) compared to other acid solutions of the same concentration. In set II the highest CFZ concentration was determined in the malic acid solution which had the highest concentration (2.8 mol/L) among other acids. On contrary, maleic acid solution at pH=1.0 had the lowest molar concentration (0.5 mol/L) and therefore CFZ was minimally dissolved. Further research will be directed toward the examination of acid structure effect on CFZ solubility.

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