

Comprehensive Research on Microsilica



Study programme Chemistry, Faculty of Natural Sciences and Mathematics, University of Banja Luka scientific study

Date of start September 13, 2018

Project duration: 1 year

Study summary:

Microsilica (MS) is a by-product of the silicon metal production with particle size in the range of 30–300 nm. Microsilica, with silicon dioxide content of more than 85%, is commonly used as an additive in Portland cement concretes and fire proof material to improve their properties due to amorphous nature and extremely high surface area.

How to better utilize Microsilica resource, especially to low quality Microsilica is one of the main issues of R-S Silicon Company that will be addressed through this study. The study is divided into three different sequences to provide more comprehensive results and to give the company future ability to decide in which direction to go.

First part of the project will deal with evaluating microsilica influence of crops and use of plant secondary metabolites in crop protection. The questions to be answered are: what effect does microsilica has on crops growth and can we adsorb plants active compounds on microsilica to be applied it in the crops protection.

Second part of the research deals with carbon - microsilica and alumina – microsilica composites as sorbents for the water filtration. It is also expected that microsilica particles could be combined with wooden cellulose waste (active carbon) to make good and cheap material for water filtration.

Third part of the project will deal with microsilica as a carrier for selected commercial pesticides. Question to be answered is: Can we use microsilica particles as a carrier for selected commercial pesticides and can we control pesticide release (adsorption-desorption)?

Fourth part of the project will be an attempt to cover the silica particle with carbon shells. In this experiment the waste cellulose fibers from the local paper mill will be applied. This way the combination of two waste materials should give a valuable product applicable in batteries industry.

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Type: PI = Principal Investigator, CI = Co-investigator, RA = Research Assistant.

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