

Utilizing Silica Particles Synthesized from Rice Straw Waste in The Formulation of Facial Scrub

Kumarasiri, B.U.K.¹, Bandara, I.L.V.L.S.¹, Madhusanka, B.G.D.¹, Wijegunawardana, N.D.A.D.², Varathaseelan, S.D.³, Fernando, L.R.¹

¹*Department of Materials Technology, Faculty of Technology,
Rajarata University of Sri Lanka.*

¹*Department of Bioprocess technology, Faculty of Technology,
Rajarata University of Sri Lanka.*

³*University of Southeast Norway*

**ent1718046@tec.rjt.ac.lk*

This study focuses on harnessing the potential of rice straw waste by synthesizing silica particles using the Sol-gel method for integration into facial scrubs. Samples were collected from the Mihintale area, Anuradhapura District, and processed to extract silica particles. Elemental analysis through energy-dispersive X-ray spectroscopy (EDX) highlighted that the extracted samples were rich in silicon and oxygen, with some minor impurities such as carbon, chlorine, and potassium. The synthesized silica particles, examined through the particle size analyzer, have shown that the majority of particle sizes vary between 1µm and 40µm. The extracted silica was formulated into the facial scrub prepared using raw honey and aloe vera as the main ingredients. The formulations underwent multiple tests, including microbial, pH, and moisture percentage. Results indicated promising qualities for skincare, ensuring safety, optimal hydration, and gentle effects on the skin. This research demonstrates the feasibility of repurposing rice straw waste into a valuable material and utilizing it in a product with a market value. The comprehensive analysis of material properties and skincare product efficacy signifies a promising avenue for sustainable and functional skincare solutions.

Keywords: *Rice straw; Silica particles; Face scrubs; Cosmetics; Rice straw ash; Exfoliation*