

Preparation of Bio-Based Silica from Food Waste and its Potential Application in Low Cost Water Purification and Juice Clarification System

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ABSTRACT

The study involved the extraction of amorphous silica from corn husks and sugarcane bagasse using the sol-gel method. Our goal is to produce nanoparticle silica membranes from different materials that are agricultural waste and used in water purification and juice clarification. Sol-gel is the most common method of converting ash to silica gel. This method has a double benefit; Valuable silica particles can be produced at a lower cost reducing disposal and contamination challenges, so we invented a system that can be used in our water purification and juice clarification and is not too expensive because it is made to starting from food waste and economically beneficial. Natural silica has been claimed to be safe to handle, inexpensive, and can be generated from inexpensive processing. The amount of SiO₂ present in the sugarcane bagasse ash and corn husks was approximately 53.10% and 64.32%. Silica is the most valuable and abundant component of the earth's crust and is used in synthetic technology. The clear silica xero-gel membrane was characterized using Fisher FTIR & KARL techniques. Various water purification techniques are used and are too expensive, but bio-based silica membrane for water purification is one of the simplest, most effective and inexpensive methods and useful for future aspects. Bio-based silica is also used in juice clarification, removes its turbidity and also improves its visual quality.

Keywords: Agriculture waste, nano particles, silica gel, sol-gel method, water purification.