LIFE+ COSMOS-RICE

COLLOIDAL SILICA MEDIUM TO OBTAIN SAFE INERT FROM RICE HUSK ASH

THIS PROJECT WILL USE AN INNOVATIVE EXTRACTION PROCESSES IN ORDER TO OBTAIN SILICA GEL (BIOSILICA) FROM RICE HUSK ASH. THE PROCESS IS BASED ON AN INNOVATIVE TREATMENT FOR THE TEXTURATION OF VEGETABLE STRUCTURES CALLED ISTANTANEOUS CONTROLLED PRESSURE DROP (DIC). THE TECHNOLOGY WILL ALSO USE UNBURNT RICE HUSKS AS SOURCE OF BIOSILICA IN ORDER TO EXTRACT AND VALORIZE OTHER COMPOUNDS AVAILABLE IN RH (OF ITS ORGANIC PART).

Recently a new method to inert fly ash from MSWI with a room temperature process has been developed at the University of Brescia.

This process is based on chemical reaction that occurs opportunely mixing MSWI fly ash, previously added with coal fly ash (CFA) and flue-gas desulphurisation (FGD) residues fly ash, with commercial colloidal silica formulation.

Based on promising results recognized by European Commission that financed original COSMOS project, COSMOS-RICE project intends to demonstrate how obtained result can be farther improved, using mainly rice husk/hull ash (RHA) as source for silica gel:

i.e. inertize MSWI fly ash, using rice husks ash (a waste ash material) or even simply treated rice husks as source of silica, that involves lower economical and environmental costs.

A final target of this research is to evaluate the real performance of the new materials obtained by the treatment so as the actual and potential markets for the final products.

First results demonstrate that the obtained inert product (so-called COSMOS, name that will be maintained also for the inert produce with COSMOS-RICE technology) show good mechanical properties when employed as a filler. This fact makes us confident that new inert will be able to significantly contribute to the reduction of the quantity of the fly ash that is being discarded.

Moreover, the use of recycled inerts will lead to reduced natural resources consumption - one of EU's main environmental targets. The production of the new inert may result as strategic for Europe, where more than 20% of resources used is imported.

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Two processes will be tested in course of this project:

2nd process is intended to treat rice husk ash that is produced in Municipal Solid Waste Incinerators to extract silica.

1st process is intended to treat rice husks and other dry herbal plants that were pre-fermented or pyrolysed to produce silica and liquid bio-fuel.

Both processes will be incorporated in a pilot plant that will be able to produce about 50 kg/h of silica.

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