

Effect of low pressure plasma on brown rice

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Low pressure plasma is one of the most widely used mechanisms for processing materials especially to modify their surface properties. The application of low pressure plasma in agricultural sector has also been realized. In this research, low pressure plasma was generated at radio-frequency and about 2.0 mbar in a vertical plasma reactor. The reactor is to facilitate plasma treatment of very short plasma residence time (0.1 s). This low pressure plasma has then been applied to treat a whole grain of pigmented or brown rice. We have also studied this effect on white rice as a comparison. It has been found that low pressure plasma have significantly reduced an optimal cooking time, lowered moisture content and promoted water absorption. The rheological property, using rapid-visco analysis, has indicated further significant changes in peak viscosity, setback and enthalpy ΔH after plasma treatment. SEM images show the plasma treatment has caused the rice grain surface to be more porosity.

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