Optimization of conditions for production of sago starch-based foam

ABSTRACT

Production of sago starch-based foam involved mixing of sago starch with polyvinyl alcohol (PVA) or polyvinyl pyrrolidone (PVP) followed by preparation of electron beam irradiated sago starch/PVA and sago starch/PVP sheets and expanding them in a microwave. The results revealed that good foams with high linear expansion and closed cell structure can be produced from 25:15 of sago starch:PVA and 30:10 of sago starch:PVA blends prepared at 80 °C and electron beam irradiated at 15 kGy or 10 kGy for the cross-linking process. An increment of sago starch in the blends enhanced the linear expansion of the foams produced. Change in the blend morphology was observed when it was exposed to higher irradiation doses as electron beam irradiation induced the cross-linking in PVA and PVP, and leaching of amylose and amylopectin from the starch granules. Sago starch/PVA blend is more suitable for foam production because it produced flexible and glossy foam as compared to sago starch/PVP blend which produced very rigid foam.

Keyword: Starch, Irradiation, Biodegradable, Foam production