

2013 臺灣國際科學展覽會

優勝作品專輯(國外作品)

作品編號	120026
參展科別	環境科學科
作品名稱	Utilization of Starch for production of plastic-like material
得獎獎項	三等獎

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ABSTRACT OF EXHIBIT

TAIWAN INTERNATIONAL SCIENCE FAIR

The research is based on the production of biodegradable plastic-like material by only using household materials. Also, it can be made at home and it causes no harm to the environment. The biodegradable plastic-like materials made by different ratio of amylose, amylopectin, glycerol and water has different use. The finished product has smooth surface, highly transparency and well flexibility. Also, it can support strong load and be able to be deformed under stress.

Ratios of components are tested on:

1. Easy to injection mold
2. Flexibility
3. Tensile strength and ductility &
4. Water resistance.

It is found that the ratio of tapioca starch: glycerol: water = 1.5: 0.5: 9 can withstand 13N of force and 1.5: 0.93: 9 with high ductility. To improve water resistance, more amylopectin should be added to amylose. The best water resistance ratio is glutinous rice flour: tapioca starch: glycerol: water = 0.6:0.91:0.5:9 can withstand 16N force, while 0.6:0.91: 0.93:9 and 1.35:0.16: 0.5:9 with high ductility.

All materials are available in supermarkets. Higher ratio of tapioca starch can produce bookmark, with laminate effect. More tough, higher ratio of glutinous rice flour can make cups, spoons and dishes.

評語

This study is based on the production of biodegradable plastic-like material by using tapioca starch, glycerol, amylose, and amylopectin. The results showed that higher ratio of tapioca starch can produce bookmark with laminate effect. More tough, higher ratio of glutinous rice flour can make cups, spoons and dishes.