THE SURFACE PROFILE AND FUNCTIONAL GROUP OF BIO-PLASTIC COMPOSITES IN VARIATIONS OF RATIO OF STARCH, GLUCOMANNAN AND CARRAGEEAN

by
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PRELIMINARY
Several studies have been done to make bio-plastics of starch, glucomannan and carrageenan individually. However, mixing of these three materials in forming of bioplastic composites of starch, glucomannan and carrageenan is not yet known, especially the characteristics of surface profiles and functional groups.

RESULTS

Figure 1. The profile of the surface on longitudinal
Figure 2. The profile of the surface on transverse
Figure 3. The wave number and functional groups

CONCLUSION
The profile of the bio-plastic composite surface at longitudinal position indicates the presence of wada and air cavities. The wada and air cavities are further enlarged as changes in the ratio of starch, glucomannan and carrageenan mixture of bio-plastic composites ranges from the ratio (6: 0: 0); (5: 0.5: 0.5); (4: 1: 1); (3: 1.5: 1.5); (2: 2: 2); (1: 2.5: 2.5) and (0: 3: 3) each weighing 6 g mixed aqueous 100 g, 0.2 g of 25% acetic acid and stirred for 10 minutes with a spatula in a beaker glass, after which the plasticizer added 1 g glycerol. The mixture is stirred again with a spatula for 10 minutes to keep the mixture homogeneous. Next, the mixture is heated and stirred in a water bath at a temperature of 70 °C to form a gel. The formed gel is then printed to Teflon with a diameter of cm. After that it is dried on an automatic cabinet dryer with a hot air rate of 5 ± 0.1 m/h at a temperature of 50°C for 5 hours. The formed bio-plastic is lifted slowly and cooled to room temperature for 24 hours and ready to be identified. The identification of the surface profile of the bio-plastic composites was performed on the transverse and longitudinal sides by using SEM, while the identification of functional groups was performed using an FTIR spectrometer.

PURPOSE
To identify the characteristics of bio-plastic composites, especially the surface profiles and functional groups made of mixed of starch, glucomannan and carrageenan in different ratios.

METHODS
Bio-plastic composites are prepared as follows: Starch, glucomannan and carrageenan with a ratio (6: 0: 0); (5: 0.5: 0.5); (4: 1: 1); (3: 1.5: 1.5); (2: 2: 2); (1: 2.5: 2.5) and (0: 3: 3) each weighing 6 g mixed aqueous 100 g, 0.2 g of 25% acetic acid and stirred for 10 minutes with a spatula in a beaker glass, after which the plasticizer added 1 g glycerol. The mixture is stirred again with a spatula for 10 minutes to keep the mixture homogeneous. Next, the mixture is heated and stirred in a water bath at a temperature of 70 °C to form a gel. The formed gel is then printed to Teflon with a diameter of cm. After that it is dried on an automatic cabinet dryer with a hot air rate of 5 ± 0.1 m/h at a temperature of 50°C for 5 hours. The formed bio-plastic is lifted slowly and cooled to room temperature for 24 hours and ready to be identified. The identification of the surface profile of the bio-plastic composites was performed on the transverse and longitudinal sides by using SEM, while the identification of functional groups was performed using an FTIR spectrometer.

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