THERMO AND STRUCTURAL ANALYSES OF TRAYS (BAKED FOAMS) MADE FROM PEA STARCH AND COCONUT FIBRE

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There is an increasing search for feasible alternatives to replace synthetic, non biodegradable materials coming from non-renewable sources on the production of packaging materials worldwide. Through this project, the opportunity that was explored was the use of pea starch combined with coconut fibre for the production of baked foams trays. For the production, different concentrations of fibre (10/20 grams), water (100/150 grams) and starch (80/100 grams) were used. A range of 80 to 115 grams of the resulting material (referred here as dough) was prepared for pressing into trays. The samples were pressed at 130°C for 3 minutes. The formulations containing fibre were visually more homogeneous than the formulations containing only pea starch. However, two of the samples containing only pea starch (115 and 120 grams) were also very homogeneous. The samples prepared with 80 grams of dough for pressing showed holes and discontinued zones. The micrography analyses indicated the presence of air in the samples, a desirable characteristic in this kind of material. It was not possible to identify starch granules, proving the efficiency of the pressing process. The diffratograms of the samples with and without fibre showed crystalline peaks in the region 2θ (20). In the thermograms (DSC) vitreous transitions around 50 to 60 ºC were observed. In the samples with fibres, vitreous transitions were observed between 80 and 90 ºC. A large endothermic transition in the region of 100 ºC was observed. Close to the region of 170 ºC, exothermic peaks were observed which may indicate molecular restructuration.