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ISOTHERM CRYSTALLISATION OF POLYPROPYLENE - MULTIWALL CARBON NANOTUBE COMPOSITES

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Crystallisation and melting properties of polymeric materials are very important as they determine the mechanical and other properties. Nanocomposites are widely investigated, however only a few reports exist on the crystallisation and melting behaviour of polypropylene carbon nanotube composites. Our investigation is focused on multiwall carbon nanotube containing polypropylene composites. Polypropylene homopolymer was used in the experiments. Concentration series were prepared using carbon nanotube containing masterbatch. The nanocomposites were characterised by scanning electron microscopy and by mechanical measurements. DSC technique was used to determine the crystallisation and melting properties of the manufactured materials. Isothermal and non isothermal crystallisations were carried out. Polymorphic behaviour of the polypropylene was investigated by different heating rates. It was found that carbon nanotube has nucleating effect in the crystallisation process. Isothermal crystallisation data were processed by the well known Avrami equation. Crystallisation rate constants were determined together with the Avrami's quotient. A definite change was found in the melting curves of the materials.