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Bio-based Content Measurement by Radiocarbon Analysis in Thailand

Using of bio-based plastic products is one of popular solution for reducing environmental problems. Bio-based plastics is combination of bio-based carbon (have radioactive carbon isotope) and fossil carbon (no longer have radiocarbon remaining), accordingly, radiocarbon or carbon-14 in plastic product comes from bio-based carbon. Identification of bio-based content in plastic products is measurement of carbon-14 which is based on ASTM D6866; Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis. Benzene synthesis under vacuum condition was used as conventional sample preparing process. Benzene from bio-based plastic sample is mixed with scintillator and measured carbon-14 activity contained in plastic sample by liquids scintillation counter (LSC). For accuracy and reliability of result, carbon-14 activity in bio-based plastic samples are compared with activity of reference materials (as background and standard activity).

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