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## Identification of waste plastics Using Fourier Transform Infrared Spectroscopy

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In this work we present a technique of sorting out waste plastics using FTIR spectroscopy. The IR spectroscopy involves irradiating a sample with light then measurement of absorbance or transmittance is done. This absorption occurs as a result of the vibration and rotation of molecules. Each sample has a unique spectrum, and an analysis of the IR spectra is able to provide the identity of the sample. The past centuries have seen an exponential rise in the production and demand for plastics. Similarly, inappropriate plastic disposal and fragmentation of plastic materials has resulted to an increase in plastic particles and fibers. In order to combat plastic pollution, the issue of plastic recycling has gained importance in recent days. Most plastics are collected without any applied criteria and dumping of these plastics results in the loss of materials that can be reused and leaching of additives which later result to water pollution. Recycling is important as it plays a critical role in the sustainable use of resources. It can also generate revenue if it is turned into a profitable industry. The major key to profitability relies in a technique of identification and classification of plastics that can be efficient and reliable. For economic motivation in the recycling sector then there has to be a balance between capacity, fractional purity and recovery. The first criteria in the process of recycling is sorting and classification of the plastics. Methods that are based on optics have proved efficient in the characterization of plastics and thus pose a greater potential for in situ measurements. This study proved that FTIR can be used in the identification of various plastics and thus fulfil the criteria mentioned above. The method is fast, simple and the results can be reproduced.

Key words: Spectroscopy, FTIR, Absorbance, Spectra and Wavelength

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