

## **FOURIER TRANSFORM INFRARED SPECTROSCOPY AS A TOOL TO MONITOR CHANGES IN PLANT STRUCTURE IN RESPONSE TO SOIL CONTAMINANTS**

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### **Abstract**

Fourier transform infrared spectroscopy (FTIR) can be used as a tool to monitor changes in plant cell structures caused by organic soil contaminants. This study specifically focuses on the use of FTIR to determine the effect of benzotriazole (BT) and 5-methylbenzotriazole (MBT) on the structure of sunflower plants. BT and MBT are corrosion inhibitors commonly used in aircraft deicing fluids, and they are found in chemical formulations used to prevent freezing of cooling systems. These chemicals have been detected in ground and surface waters and soils near facilities that utilize and/or produce them. Our group currently studies possible methods to remediate BT and MBT by way of phytoremediation using sunflowers. However, the fate of BT and MBT within the plant is not well known. FTIR can be used to determine the fate of these contaminants within the plant and how they change the plant cell structure. Previous studies have provided evidence that BT and MBT can be taken up by sunflower plants and can possibly be incorporated into the plant structure by lignification, since they cannot be extracted from dry plant matter. The structure of sunflower plants grown in Hoagland's solution with 30, 60, and 90 mg/L of BT and MBT was analyzed and compared to untreated plants to observe changes in plant structure. Based on our observations, the FTIR technique shows potential for detecting structural changes induced by the presence of these contaminants and may be used to prove the capability of plants to phytotransform organic contaminants.

**Key words:** FTIR, triazole, phytoremediation, phytotransformation, plants