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## Spectral Analysis of Reflected Soft X-ray for Detecting Foreign Materials in Foods

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A continuous soft X-ray system with a semi-conductor detector was used to detect foreign materials in food samples. Basic properties of transmitted and reflected soft X-ray for some metallic and non-metallic materials were measured using the Si-PIN sensor equipped with a multi-channel analyzer. Soft X-ray spectra in photon energy were obtained for copper, galvanized iron, acrylic, vinyl chloride and glass of different thickness as foreign materials in foods. This detecting system was capable of analyzing intensities of transmitted and reflected X-rays at each energy level in the broadband. The reflected soft X-ray spectra were found to have characteristic spectrum curves for each sample. In order to detect acrylic, vinyl chloride and glass in a hamburger patty, the reflected soft X-ray spectra were analyzed and this technique was found to have the potential for more sensitive detection of foreign materials. The detecting system using properties of transmitted and reflected X-rays at each energy level is considered to be valid for non-metallic foreign materials.

**Keywords:** [soft X-ray](#), [spectra](#), [transmittance](#), [reflectance](#), [detection](#), [physical foreign material](#), [food](#)

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