SEM

A scanning electron microscope (SEM) is a type of electron microscope that produces images of a sample by scanning the surface with a focused beam of electrons.

The electrons interact with atoms in the sample, producing various signals that contain information about the surface topography and composition of the sample.

PRINCIPLE OF SEM

The signals used by a SEM to produce an image result from interactions of the electron beam with atoms at various depths within the sample.

Various types of signals are produced including secondary electrons (SE), reflected or back-scattered electrons (BSE), characteristic X-rays and light (cathodoluminescence) (CL),absorbed current (specimen current) and transmitted electrons.

Secondary electron detectors are standard equipment in all SEMs, but it is rare for a single machine to have detectors for all other possible signals.

APPLICATION OF SEM

- The technique serves as a promising and reliable method for microstructure analysis particularly in novel formulations, innovations with particular properties, food textures, and also detection of defects in foods.

- It is a powerful tool that identifies organic as well as inorganic contaminants found in foods that undergo product recall or are detected during quality analysis in production areas.

- In comparison to other foods, milk and milk products have been extensively studied by SEM, owing to their microscopic and submicroscopic fine particle size.

- SEM has been employed to assess the physicochemical, water vapor barrier, and mechanical properties of biodegradable corn starch and chitosan composite films that have been found to have better

UNIT 2

Microscopic techniques in food analysis

properties than cellophane , Postharvest changes in fruits and vegetables.