

SEM is utilized to identify FA amorphous phase composition. The latter produces a signal which is proportional to the number of attracted electrons. An energy-dispersive x-ray analyser (EDXA) was performed using a computer program to point count the particles of the amorphous phases. These particles were investigated quantitatively for eight main elements: iron, oxygen, calcium, aluminium, potassium, sodium, carbon, and silicon. SEM works by using an electron beam that penetrates deep into a sample with about 1 μm . The beam of the SEM centre toward a point, followed by signals reading by detectors that were then converted into intensities to create an image on the attached computer. The signals are created due to the hitting of valence electrons by a beam, which is accordingly emitted from the atom. These emitted x-rays are characteristic of the sample's elemental composition.