

Magnifying the Truth: A Look Into TEM and SEM in Forensic Science

Presented by
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Friday, October 6, 2023
Noon to 12:50 p.m., Ag Mechanics, Room 102

Abstract

Forensic science applies the scientific method to the examination of evidence collected at a crime scene. In terms of evidence, this can range from being macroscopic like a shoe mark impression to microscopic like a pollen grain or skin cell. To analyze evidence, various analytical techniques and scientific tools are used such as gas chromatography which is used to analyze ingested drugs or alcohol prior to death, or PCR which is used to amplify a small amount of DNA collected at a crime scene. Interestingly, microscopy can also be used to analyze different forms of evidence by magnification. Conventional light microscopes provide good magnification and resolution for a variety of evidence but more recently electron microscopes are being used to provide high levels of magnification and resolution that are incomparable when it comes to forensic analysis. Two common electron microscopes are transmission electron microscopes (TEM) and scanning electron microscopes (SEM). TEM provides higher magnification and resolution when compared to SEM, however, the sample needs to be 200 nm or less in thickness, therefore sample preparation can be tedious. On the other hand, SEM observes the surface morphology of the sample, and can therefore be used to analyze much thicker samples than TEM, however, the cost is reduced magnification. In this talk, the applications of TEM and SEM in forensic science will be discussed to see how each provides crucial information about the evidence.