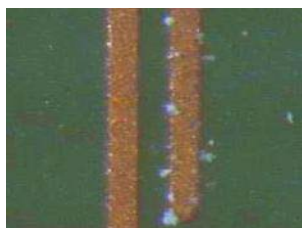
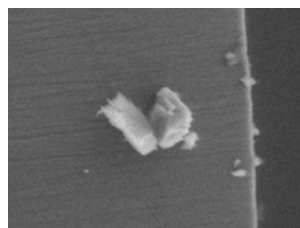


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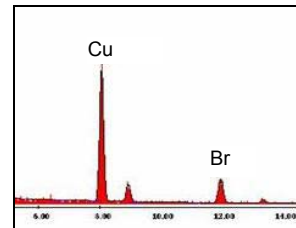
Case Study	Identification of corrosion products and efflorescences on printed circuit boards (PCBs)
Problem	Corrosion appeared at the positively charged circuit path of a multi layer PCB after stability studies under humid conditions. Goal was to trace back the efflorescence to either one of the layers (laminate, solder resist) or the process conditions, such as galvanic processes or hot air leveling (HAL).
Solution	<p>Since the efflorescences were too small for standard isolation surface sensitive techniques were applied such as Scanning Electron Microscopy (SEM) in combination with Energy Dispersive X-ray (EDX) to identify potential elements within the efflorescences.</p> <p>In addition, the particles were picked up and transferred to neutral supports (e.g. scalpel point) and diamond window by “micromanipulation tools” to access them for both SEM-EDX and chemical analysis with FTIR-Microscope (Fourier Transform Infrared spectroscopy coupled to Microscopy) without the PCB background.</p>
Application/Use	Several techniques are available to identify microscopic contaminants. These include Optical Microscopy (OM), SEM-EDX, Transmission Electron Microscopy (TEM-EDX), Time of Flight Secondary Ion Mass Spectrometry (TOF-SIMS) and FTIR-Microscopy in combination with state-of-the-art preparation techniques from cryo-ultra microtome to micro extraction on micro meter level with micromanipulation



Micrograph of efflorescences on the right circuit path



SEM image of isolated efflorescences, approx. 5x5µm²



EDX spectrum of isolated efflorescences

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