Molecular and Elemental Material Characterisation

Correlative RISE/EDS Microscopy
RISE Microscopy

RISE instruments seamlessly integrate confocal Raman imaging and scanning electron microscopy (SEM). They incorporate the sensitivity and non-destructive nature of Raman spectroscopy with the atomic resolution of electron microscopy. Raman imaging enables the identification of molecules, their allotropes and polymorphs, the determination of their orientation, purity and crystallinity, and the detection of strain states. SEM allows for the imaging of surface structures on the nanometer scale.

Inelastic scattering of light by a molecule

Benefits

RISE Imaging and Scanning Electron (RISE®) microscopy combined with energy-dispersive X-ray spectroscopy (EDS) offers comprehensive sample characterisation at the nanoscale.

<table>
<thead>
<tr>
<th>Detailed insight</th>
<th>Molecular and bonding information, crystallinity, material stress and strain, crystal orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDS</td>
<td>Elemental quantitation and distribution, microstructure and crystal structure</td>
</tr>
<tr>
<td>Wide-ranging analysis</td>
<td>Sub-micron and large-area molecular information, 3D chemical imaging</td>
</tr>
<tr>
<td></td>
<td>Point analysis, large area mapping, particle analysis</td>
</tr>
<tr>
<td>Dynamic vision</td>
<td>Analysis of chemical processes possible</td>
</tr>
<tr>
<td></td>
<td>Live Chemical Imaging in real time with AZtecLive</td>
</tr>
<tr>
<td>Multimode operation</td>
<td>Independent Raman operation, Raman-SEM image correlation</td>
</tr>
<tr>
<td></td>
<td>Simultaneous SEM and EDS data acquisition</td>
</tr>
</tbody>
</table>

RISE Microscopy
EDS Analysis

EDS (Energy Dispersive X-ray Spectroscopy) is a technique for elemental and compositional analysis based on the detection and analysis of X-rays produced by electron irradiation of a sample. Ionisation causes an inner-shell electron of constituent atoms to be ejected. This creates a vacancy in the electron orbital. An electron from an outer shell, with a higher energy level, transfers to the inner shell to stabilise it, and an X-ray is emitted during this process. This so-called characteristic X-ray has a specific energy value for each element. From such signals, it is possible to determine microstructure, composition and crystal structure.
Battery materials

Investigation of battery cathode materials. EDS (top row) reveals the distribution of the individual metallic elements. RISE delivers complementary information on microstructure and the distribution of chemical components along with the carbon matrix.

Nutritional supplement tablet

Components of a nutritional supplement tablet. The RISE image visualises the distribution of the ingredients on the surface and the EDS data shows its contained elements.
Analysing a geological sample with EDS and RISE reveals the distribution of the elements and minerals along with the microstructure through SEM.
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RISE: Raman Imaging and Scanning
Electron microscopes

Unity: The world’s first
Backscattered Electron and X-ray (BEX) Imaging detector

Explore the possibilities of RISE/EDS
https://www.oxinst.com/campaigns/correlative-rise-eds-microscopy