MIMOSA
TECHNICAL CONSULTING & CONTRACTING

Materials Science Experiments

Representative experiments assembled from Leybold physics and chemistry ranges

12 illustrated examples selected from the wider Leybold / LD DIDACTIC educational range.

VIEW • SELECT • CONFIGURE • INSTALL • TRAIN

Available experiment examples

P6.3.3.1 | Materials / solid-state physics

Bragg diffraction at a monocrystal

Use a radiation-protected X-ray apparatus and goniometer to verify Bragg's law.

EXPERIMENT EXAMPLES / LEARNING OUTCOMES
Crystal lattice spacing; characteristic radiation; diffraction order; structure analysis.





P7.2.1.1 | Solid-state physics

Hall effect in silver

Determine the Hall coefficient and identify the dominant sign of charge transport.

EXPERIMENT EXAMPLES / LEARNING OUTCOMES
Hall voltage; carrier sign; current and magnetic-field dependence; conductivity.

Available experiment examples

P1.1.2.3 | Foundation materials laboratory

Density by pycnometer

Determine liquid density precisely using a Gay-Lussac pycnometer.

EXPERIMENT EXAMPLES / LEARNING OUTCOMES
Mass and volume; calibration; temperature effects; uncertainty.





P1.8.3.3 | Materials / fluids

Viscosity of Newtonian liquids

Measure dynamic viscosity and its dependence on temperature.

EXPERIMENT EXAMPLES / LEARNING OUTCOMES
Flow resistance; material comparison; temperature control; measurement repeatability.

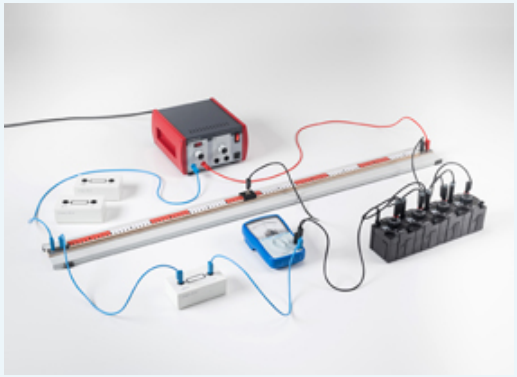
Available experiment examples

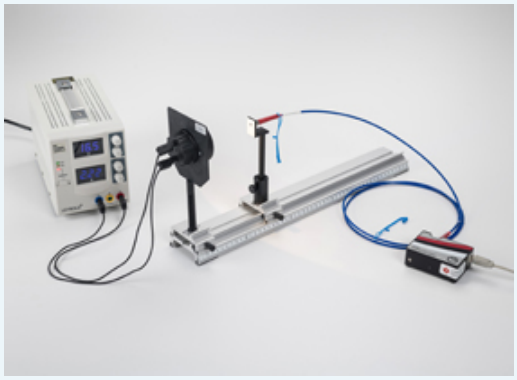
P3.2.3.4 | Electrical properties

Electrical resistance measurement

Use a Wheatstone bridge for precise resistance measurements.

EXPERIMENT EXAMPLES / LEARNING OUTCOMES
Resistivity pathway; null measurement; temperature-dependent extensions.





P5.5.2.4 | Thermal / optical properties

Thermal radiation and temperature

Relate a hot body’s emission spectrum to temperature.

EXPERIMENT EXAMPLES / LEARNING OUTCOMES
Wien displacement; spectral intensity; emissive behaviour; optical measurement.

Available experiment examples

C4.4.3.1 | Materials chemistry

Electrochemical series and corrosion pathway

Compare metal electrode potentials and connect the results to corrosion behaviour.

EXPERIMENT EXAMPLES / LEARNING OUTCOMES
Galvanic couples; noble/base metals; electrode potential; corrosion protection.





C1.1.2.1 | Thermal analysis foundation

Phase-transition measurement

Record a heating curve and identify phase-transition plateaus.

EXPERIMENT EXAMPLES / LEARNING OUTCOMES
Melting and boiling points; latent heat; digital temperature measurement.

Available experiment examples

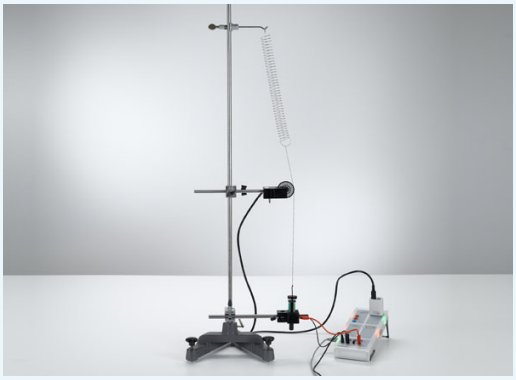
P7.1.4.2 | Mechanical properties

Elastic and plastic deformation of wires

Record extension under load and distinguish elastic behaviour from permanent deformation.

EXPERIMENT EXAMPLES / LEARNING OUTCOMES

Stress–strain behaviour; elastic limit; plastic extension; material comparison and curve evaluation.





P7.2.1.3–P7.2.1.5 | Semiconductor physics

Band gap and charge carriers in germanium

Investigate carrier density, mobility and temperature-dependent conductivity in semiconductors.

EXPERIMENT EXAMPLES / LEARNING OUTCOMES

Hall measurement; n-type and p-type behaviour; mobility; band-gap determination.

Available experiment examples

P7.5.1.1 | Materials characterization

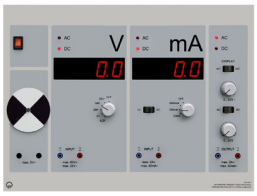
X-ray fluorescence and composition

Use energy-resolved X-ray fluorescence for non-destructive elemental analysis.

EXPERIMENT EXAMPLES / LEARNING OUTCOMES

Characteristic lines; spectrum calibration; element identification; qualitative composition analysis.





C1.5.3.3 / C4.4 pathways | Materials chemistry

Electrochemical corrosion and protection

Relate electrode potentials and galvanic coupling to corrosion and protection methods.

EXPERIMENT EXAMPLES / LEARNING OUTCOMES

Corrosion cells; sacrificial protection; coatings; electrolysis and material selection.

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