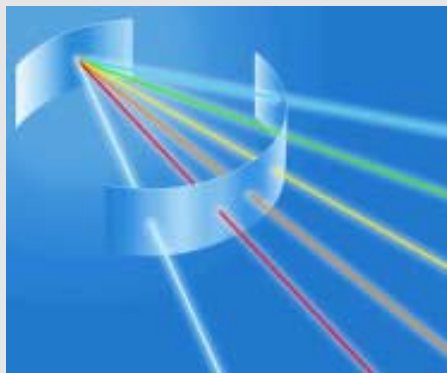


Glow Discharge Analyzers

for Quality Assurance and Material Development



Glow Discharge Analysis (GDA) made its first appearance in 1968 and was designed primarily for bulk spectrochemical analysis of various metals and their alloys. Since its introduction, this method has been steadily developed and has excelled in the areas of surface and coating analysis as well. Compared with conventional excitation techniques, the striking feature of Glow Discharge technology is the ability to discern defined surface layers in the material being examined.

In the field of metal analysis the GDA is ideal for concentration profile analysis and surface analysis. Surface treatment processes such as nitrogen-case hardening or carburizing heat treatments, can be monitored by analyzing the surface and near-surface areas of the treated material. Coating thickness and chemical composition can be accurately measured using the technique of depth profile analysis.

Glow Discharge Spectroscopy is the preferred method of analysis for materials that were previously impossible to analyze by traditional methods. Non-conductive materials and coatings such as glass, ceramics, varnish and paint layers can be analyzed using the optional Radio Frequency source (GDA 750 only).

SPECTRUMA GDA 750

With over 60 analytical element channels available, the GDA 750 Glow Discharge spectrometer is perfect for demanding applications requiring high resolution and analytical precision.

Coatings can be analyzed down to a depth of 200 μm , with a resolution of one atomic layer on the surface and 10 % relative in deeper regions.

The analytical software is powerful and flexible; chemical composition can be determined along with other characteristics such as density or mass distribution in the area of the layer being examined.

Comparison of the surface characteristics before and after the technical coating process (CVD, PVD), ensures that the production process is being optimized and that costly mistakes are avoided.

The GDA 750 is also capable of bulk analysis (chemical composition of metallic alloys) providing superior linearity of calibration for complex matrices.

Using the optional Radio Frequency Glow Discharge Lamp, the GDA 750 is proficient in analyzing non-conductive materials such as ceramics, glass and paint layers.

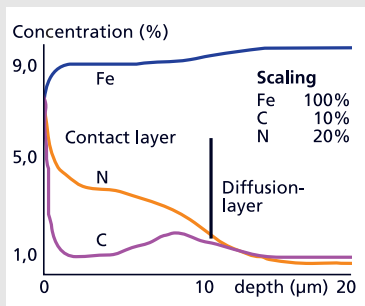
SPECTRUMA GDA 150

The GDA 150 has been developed specifically to meet the needs of small to middle-sized heat treatment, plating, and coating companies. Compact and powerful, the instrument utilizes state-of-the-art CCD technology. Reliable and accurate, the GDA 150 is proficient in ensuring that the proper surface treatment has been applied to the material during the diffusion process (nitrogen-case hardening or carburizing, oxidizing) or during the coating process, galvanizing, hard coating Physical Vapor Deposition (PVD) or Chemical Vapor Deposition (CVD). The typical analysis time of 30 seconds offers an invaluable advantage over conventional methods as users can correct production problems within minutes of their discovery.

Automatic Cleaning

After an analysis the anode can be cleaned automatically with the permanently mounted motorized reamer. The cleaning bit is made out of high quality tool steel to provide long life and ensure consistent analysis.

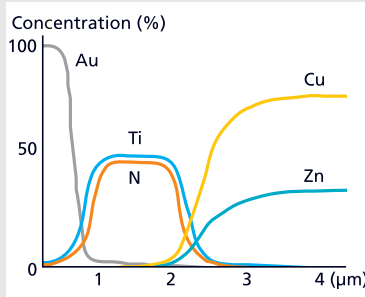




Thermochemical treatments

Determine the thickness of a layer and concentration profile of all elements with respect to depth.

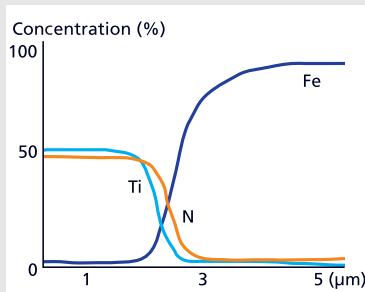
Quantify and/or qualify surface contamination, inclusions and phase ratios.



Coated sheets

Complete characterization of the coating layer with respect to chemical composition, thickness and element distribution.

Analyze non-conductive coatings such as varnishes and paints with the optional RF source.

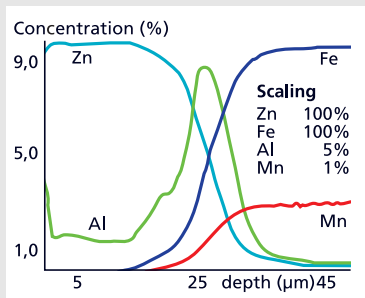


Hardphase coatings

Compound layer development can be determined by rapid analysis of the chemical composition. Other important material aspects such as depth penetration of the treatment process are possible.

Ceramics

Precise and accurate determination of the chemical composition is possible with the optional Radio Frequency source.



Galvanized materials

Galvanized layers that have a complicated structure and interface boundary can be easily analyzed.

Analyze the chemical concentration, layer thickness, mass distribution and impurities for quality assurance and failure analysis.

Applications are:

Heat treatment processes for ferrous and non-ferrous alloys, castings, hot and cold rolling of steel and non-ferrous alloys, electrochemical coating, chemical or physical vapor phase condensation, thermal oxidation processes and anodic oxidation, thin-film and thick-film technologies.



SPECTRO offers ideal solutions for any application

For analyzing any metals and alloys, SPECTRO offers the SPECTROLAB product range of optical emission spectrometers. This kind of method is widely used in the metal industries, including primary producers, foundries, die casters and many others. Due to its rapid analysis time and inherent accuracy, Arc/Spark OES systems are most effective in controlling the processing of alloys. In many aspects of the production cycle, where a chemical composition of the metallic material is required, these spectrometers can be used. This includes: incoming inspection of materials, metal processing, quality control of semi-finished and finished goods and many other applications.

The SPECTROCAST is the ideal instrument for companies looking for an economical price, rugged design and simple operation. Foundries and metal processing companies that have to analyze more than one metal base or a greater selection of elements, need the SPECTROLAB Jr.^{CCD}. For especially high analytical requirements or many metal bases, SPECTROLAB and SPECTROLAB S are used. These instruments can also be incorporated into the fully automatic metal analysis systems SPECTROLUX and SPECTROLAB ROBOTIC.



Further information

GERMANY

SPECTRO A. I. GmbH & Co. KG
Boschstraße 10, D-47533 Kleve
Tel.: +49 28 21 8 92-21 35
Fax: +49 28 21 8 92-22 35
www.spectro-ai.com
info@spectro-ai.com

U.S.A.

SPECTRO A. I. Inc.
160 Authority Drive
Fitchburg, MA 01420
Tel.: (978) 342-34 00
Fax: (978) 343-47 14
info@spectro-usa.com

GDA Features

Analysis

- Analysis of the chemical composition of homogeneous and coated materials, detection and measurement of trace and micro-alloying elements.
- Determination of concentration profiles and quantitative/qualitative evaluation of the measurement data for surface layers.
- Determination of phase/phase ratios within the analyzed surface layers.

Software

- Software is written for the Windows 95, Windows 98, or Windows NT environment.
- Routine functions are handled through the easy-to-use interface that enables users to quickly familiarize themselves with the instrument.
- Many software options are readily available to the user such as choice of display output, data transfer and data format.

Photos: SPECTRO, PhotoDisc Inc.