

# DERIVATION THERMAL ANALYSIS AT METALIC MATERIALS

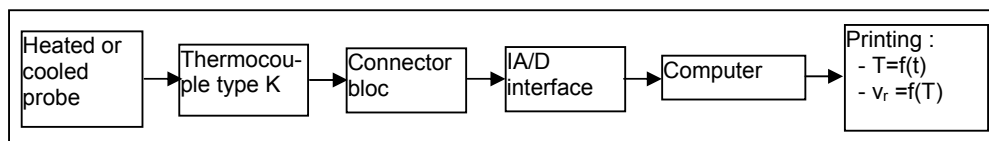
**MUDURA Pavel**  
University of Oradea  
e-mail: [pmudura@uoradea.ro](mailto:pmudura@uoradea.ro)

**Keywords:** derivation thermal analysis

Material properties, which are closely related to the chemical composition and structure of these materials, can be modified by thermal, mechanical or chemical actions. In the case of thermal actions, structure modifications take place during heating, maintaining at constant temperature and cooling with different speeds.

Thermal analysis is an investigation method using experimentally determined temperature – time functions, by which the laws of modification of certain physical or chemical properties of a material: *metal* (metals and alloys), *non-metals* (non-metals, substances, substances mixtures) or *composites*, undergoing thermal actions.

*Derivation thermal analysis*, is based on the recording of temperature variation, during the heating and cooling of analyzed metal probe, obtaining the curve  $T(t)$  (temperature- time,) and its derivative  $T'(t)$  (temperature variation speed as function of time).



*Bloc diagram of testing system*

The thermal analysis method allows the highlight of transformations, with heat release or absorption, which are taking place during heating and cooling of metals. The characteristics of this method is that it puts in evidence very small variations of temperature caused by endothermal and exothermal reactions which are happening during structural transformations and which can not be evidenced during direct or differential thermal analysis.

## REFERENCES

1. BARRALIS, J., MAEDER, G., *Metalurgie/Elaboration, structures-proprietes normalisation*, collection Les Precis AFNOR/ NATHAM, Edition Natham, 1997, ISBN Natham: 2-09-177491-X; ISBN AFNOR : 2-12-260121-6.
2. CONSTANT, A., HENRY, G., CHARBONNIER, J., C., *Principes de base des traitements thermiques et thermochimiques des aciers*, PYC Edition 1992, ISBN 2-85330-110-9.
3. \*\*\**Metalgraphie et techniques d'analyse*, EDITION PYS LIVRES, PARIS, 1998, ISBN 2-91008-17-0.