

KAWASAKI STEEL TECHNICAL REPORT

No.41 (October 1999)

*Advances in Iron and Steel Technologies,
Commemorating the 30th Anniversary of
Technical Research Laboratories*

Recent Activities in Research of Analysis and Material Science

Keiichi Yoshioka, Makoto Shimura, Akira Yamamoto

Synopsis :

This article reviews the research trends during the last decade in chemical analysis, process control analysis, surface analysis and microscopic characterization in Kawasaki Steel. The analytical methods, such as the highly accurate ultratrace analysis for steels and silicon materials and the spark discharge optical emission spectroscopy for gaseous constituents in steels, have been developed in order to meet the requirements from the material developments and manufacturing process. It is demonstrated that field emission gun Auger electron spectroscopy (FE-AES) and field emission gun transmission electron microscope (FE-TEM) have become novel powerful tools for the surface and structure characterization. The application of X-ray diffraction and Raman spectroscopy to in situ analysis at high temperature are also described.

(c)JFE Steel Corporation, 2003

The body can be viewed from the next page.

Recent Activities in Research of Analysis and Material Science*

Synopsis:

This article contains...

a matrix element, Cr was removed as $\text{Cr}_2\text{Cl}_2\text{O}_2$ vapor.³¹ This procedure isolated the elements Be, Al, Ca, Ti, V, Cr, Mn, Co, Ni, Cu, Zn, Ba, Pb, Bi, as well as rare earth elements.

sufficiently sensitive. Therefore, P was converted to molybdophosphate, which was isolated as an ion-pair with cationic surfactant, and Mo in the molybdophos-

between anomalous and normal emissions. The background intensity of O emissions could be significantly

for the catalytic gas converters of automobiles. The developed method consists of the use of a

made in the research for microscopic material characterization using FE-TEM, FE-AES and so on, and also for



Resin (sample protection)
Chromate layer
Metal Sn layer
Sn-Fe-Ni alloy layer

major tools for materials characterization, where further sensitivity and precision will be expected. We should work for the timely development of suitable analytical techniques through close cooperation with the