TECHNOLOGY OF MATERIALS

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Dear Bill
Enclosed please find a report on the analysis of the unknown object.
Please call me if you have any questions or concerns.

Sincerely,

Sam Iyengar

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SEM/EDS Analysis of an Unknown Object

Introduction:

An unknown metal sample was received at the laboratory for analysis. It was requested that the chemistry of the object be determined. The object was analyzed by SEM/Energy Dispersive X-ray Analysis to determine the chemical constituents. The following report summarizes the analytical results.

Materials and Method:

The sample labeled as follows was analyzed.

1) **Unknown Metal**

Scanning Electron Microscopy /Energy Dispersive X-ray Analysis (SEM/EDS)

In this technique, an electron microscope with an energy dispersive X-ray spectrometer is used for analysis. The electron beam in the microscope causes specimens to emit x-rays including those from the k, l and m atomic shells. Spectrometer counts of these x-rays, which are said to be "characteristic" of the elements present in the specimen, can be used to calculate composition for a full qualitative analysis. The analysis is non-destructive and is accurate to ~ 1 %.

*This technique determines the elements (**like Si, O, Ca, Fe, etc**) present in the powder sample*

Results and Discussion:

EDXRF data is also included. Elemental composition of the main body is shown in the following Table 1

- The metal is mostly iron (Fe) w/ some manganese (Mn). It also has some silicon (Si) and calcium (Ca) along with aluminum (Al). These elements may be from soil contamination.

Table 1: Elemental Composition

Elements (wt. %)	Metal Piece
Sodium	0.2
Magnesium	0.5
Aluminum	1.4
Silicon	6.1
Sulfur	0.2
Chlorine	0.3
Calcium	2.0
Potassium	0.4
Iron	86.0
Manganese	2.5