

Why EDXRF is a Unique Tool in the Petroleum Chemist Toolbox

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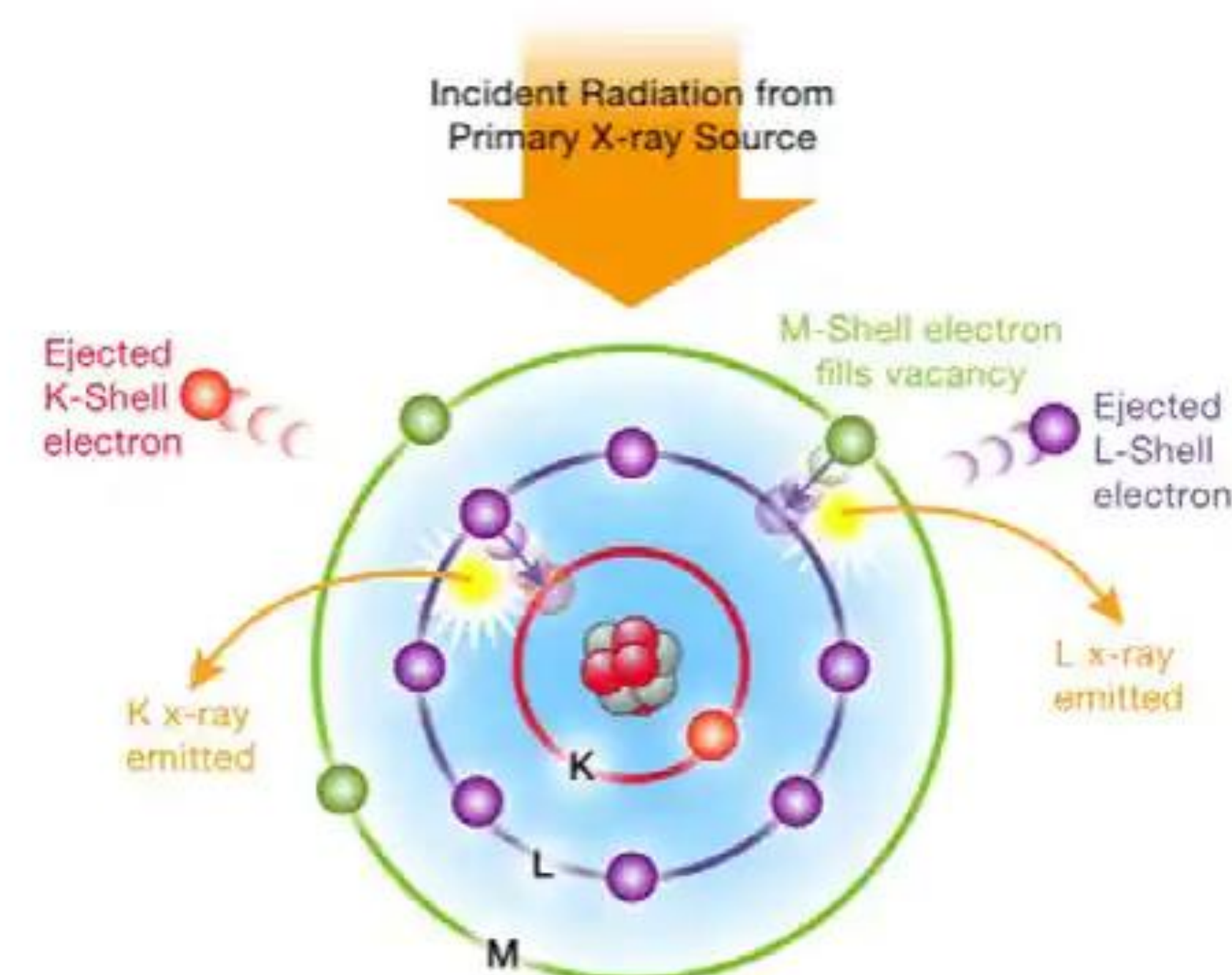
Overview

The energy dispersive X-ray fluorescence (EDXRF) Elemental Analyzer can make rapid and accurate determinations of the content of crude oil with greater ease and detail than that of the standard analysis method, optical emission spectrometry. This analysis of crude oil is imperative in assuring the highest quality after the refinement.

How Our Instrument Works

The EDXRF Elemental Analyzer takes the distinct x-rays of different elements such as sulfur, lead, etc, that make up a mixture, then separates them in a way where they can be quantified, showing us the composition of the mixture.

The X-ray of the EDXRF excites the atoms of the various elements in the petroleum sample, dislodging electrons from their orbital shells. With this, atoms stabilize by sending off fluorescent x-rays, and these fluorescent x-rays contain valuable information about the elements that are present in the mixture of petroleum.



The fluorescent x-rays have "peaks" visible on a light spectrum. The location of a peak will indicate which element is present, and the size of the peak will indicate concentration of the element in the mixture

Standard Testing Procedure

After the sample is washed and a dry run is completed, a test may begin. A sample of petroleum placed in the machine (in some cases with a control substance) with several other specimens. Different lenses may be placed over specimens to adjust clarity and accuracy that surpasses many traditional testing methods. The instrument conforms to the specifications of ASTM D4294, D5059, D6481, D7212, D7220, ISO8754, IP 496, IP 336, and JIS K 2541-1.

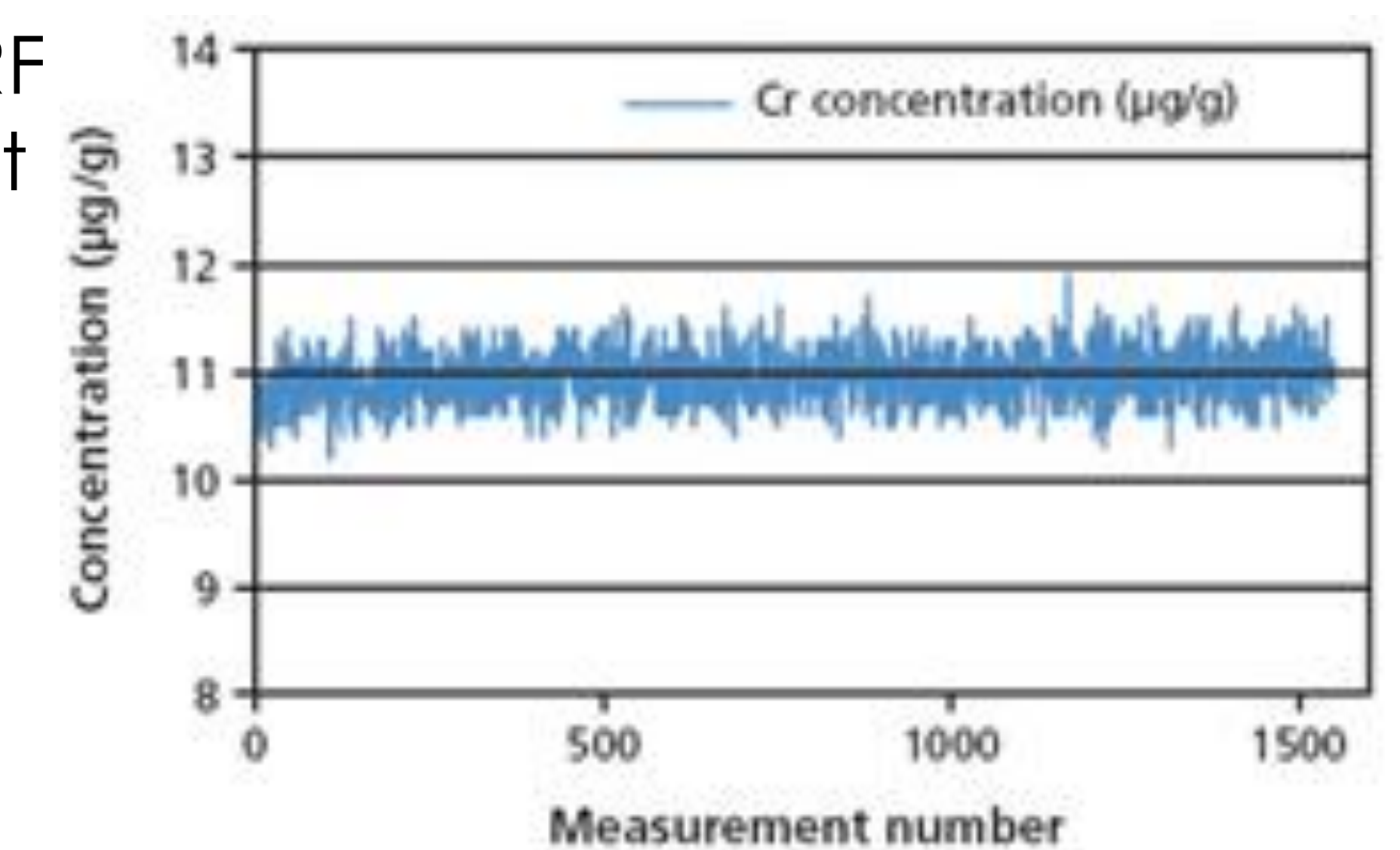
Preparation for Testing

Requiring only a light washing and weighing of a petroleum sample to prepare for testing, this not only expedites this process but makes it cheaper. The tester will undergo a dry run, then the petroleum can be used for analysis via EDXRF.



Calibration

Frequent recalibration of the EDXRF is unnecessary, and slight drifts that incur over long periods can be corrected in the software, saving valuable time and resource costs. Analyzing the concentration of a control sodium in a petroleum sample remains at the same level after many iterations in this chart.



Conclusion

In the pursuit of cheaper, faster, and more accurate analysis of crude oil during refinement, the EDXRF provides an undoubtedly superior method of elemental analysis for the determination of total sulfur in petroleum products, such as diesel fuel, jet fuel, kerosene, naphtha, residual oil, lubricating base oil, hydraulic oil, and unleaded gasoline.

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