

## **Determination and Quantification of Heavy Metals using Infrared Spectroscopy and Chemometric Techniques**

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Actually the determination and quantification of heavy metals in food has a high priority for public health, quality systems and food safety, these elements can be added to the food production system at different stages of the agri-food chain and it is essential to monitor his presence or absence through it. Until now, the methodology to perform this task is based on atomic absorption spectrophotometry that requires at least a couple of days to obtain a reliable result. The aimed of this work is develop and validate an alternative analytical method for the determination of heavy metals in several matrices, based on numerical methods and the correlation between spectrometric techniques; Atomic Force and Infrared by Fourier transform.

The presence of Hg and Pb at different concentrations seem to modify the milk spectrum in the region of proteins, lipids and OH; at 1636, 1337, 550, 3300 and 3350  $\text{cm}^{-1}$ . The presence of As, Cd, Cr Hg and Pb at concentrations even of 0.1 ppb generate characteristic IR spectra that can help to identify their presence in water. By Principal Components Analysis (PCA), was possible have a better discrimination of the samples in the same matrix (milk). Where the cloud of points in the different regions of interest, show a good discrimination for the seven metals used in this work.

### **Biography:**

Raul Delgado Macuil born in Puebla Mexico. He received B.S. degree in electronics from BUAP by Physical-Mathematics School in 1994; and he received the PhD in Optics from Astrophysical Optics y Electronics National Institute in 2005; both institutions in Mexico. Head research in the nanobiotechnology and biosensors fields in the Applied Biotechnology Research Center, a National Politechnique Institute center in Mexico. As author or co-author, about 70 scientific and professional papers have been published. He is a head of 21 national projects and more than 25 graduate and postgraduate thesis has been directed, have more than three thousand nationals and international congress participations.