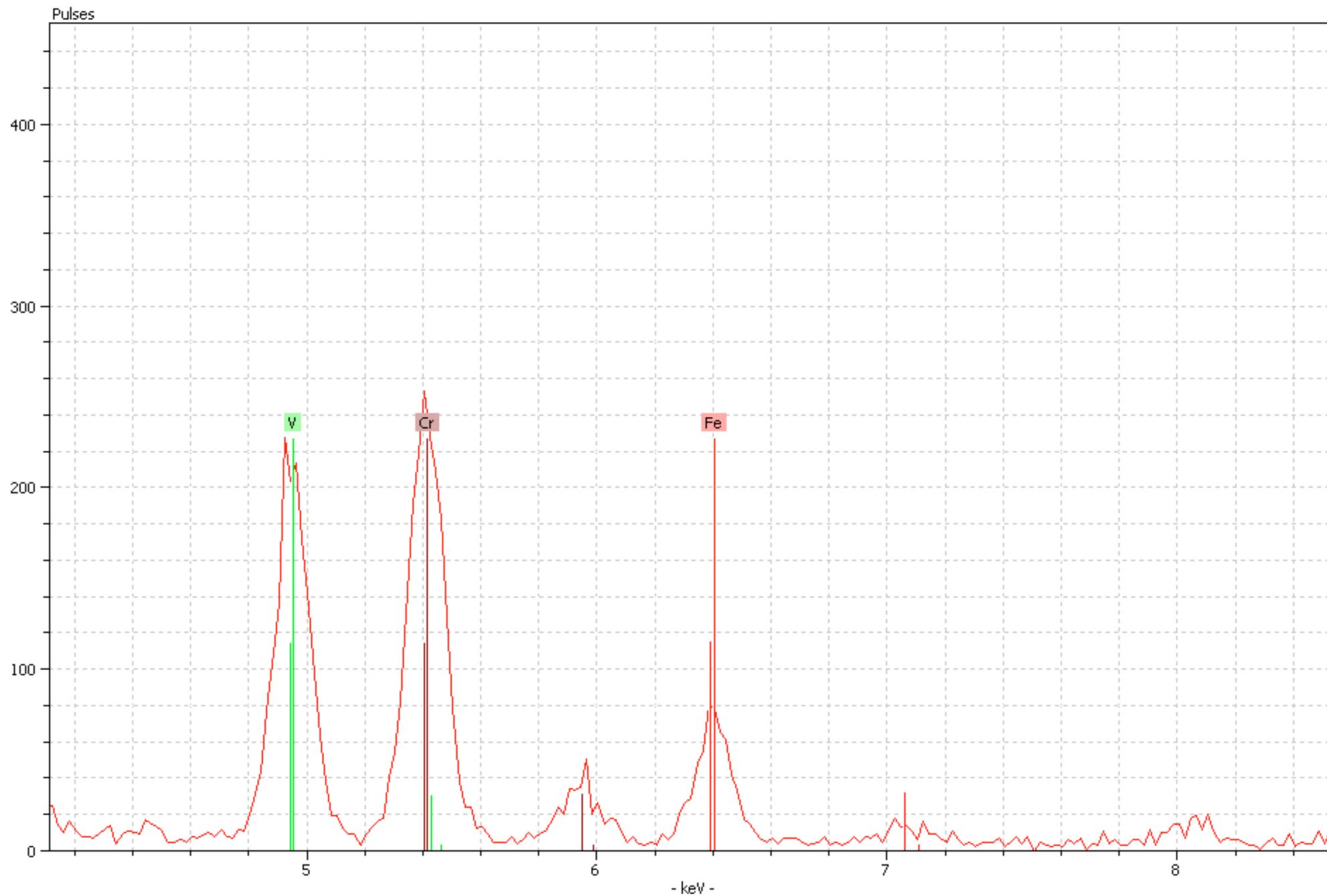


Gemstone Identification

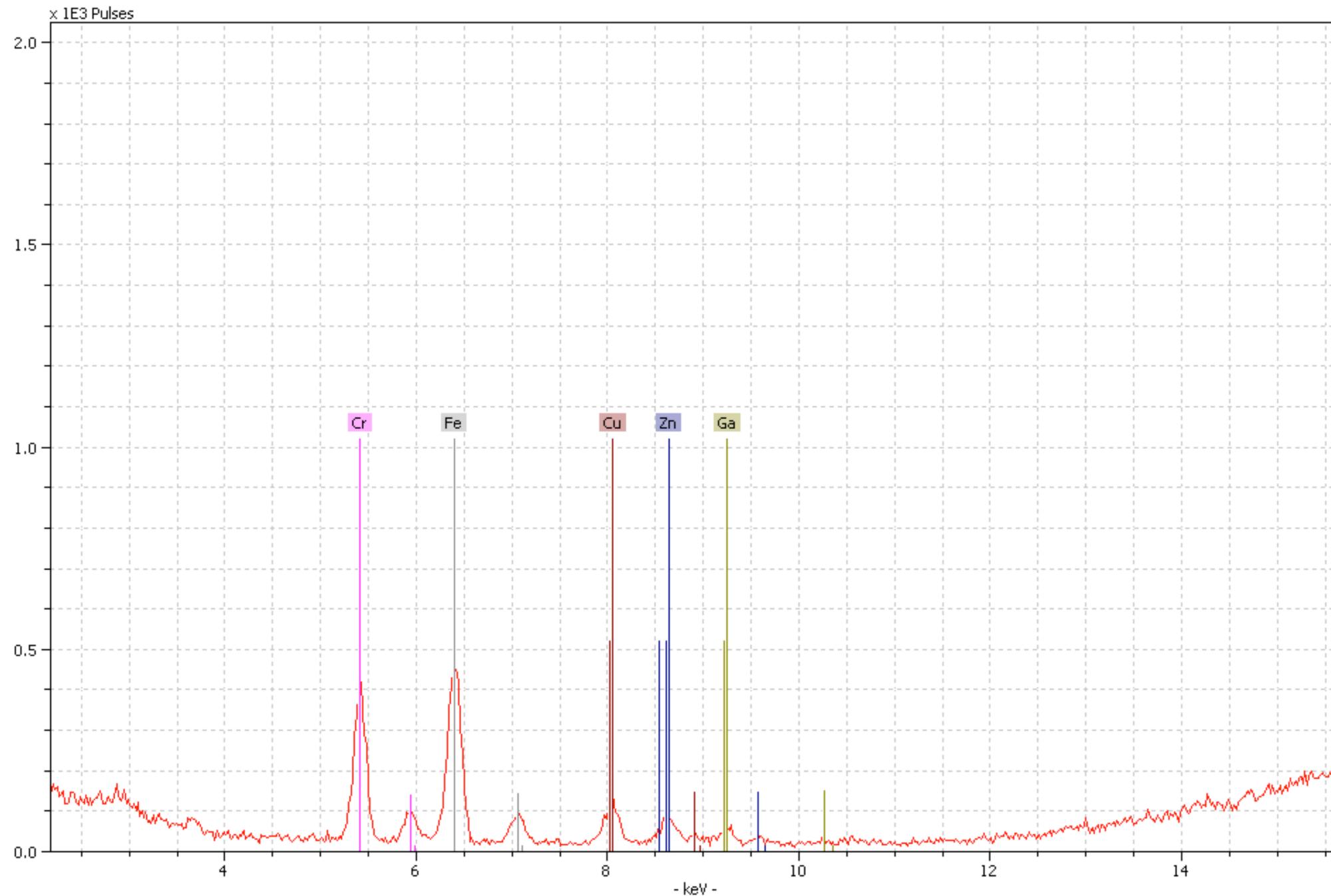
A Primer
B. Lee Drake

Emeralds



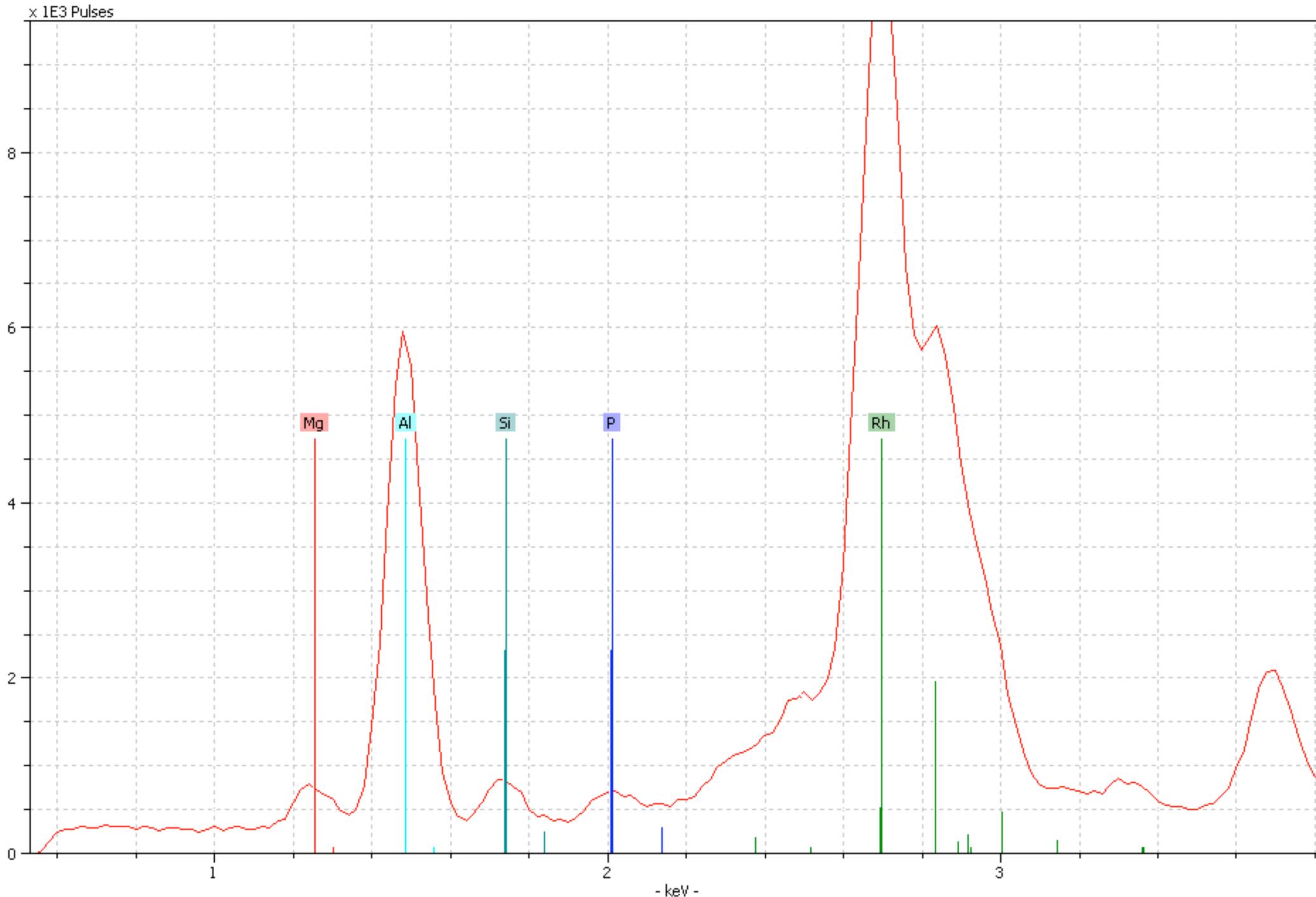
Emeralds are green semi-translucent gemstones - they contain the elements Beryllium (Be), Vanadium (V), and Chromium (Cr). Only V and Cr are visible to EDXRF, in this spectrum we can see the presence of both of these elements in an Emerald ring.

Ruby



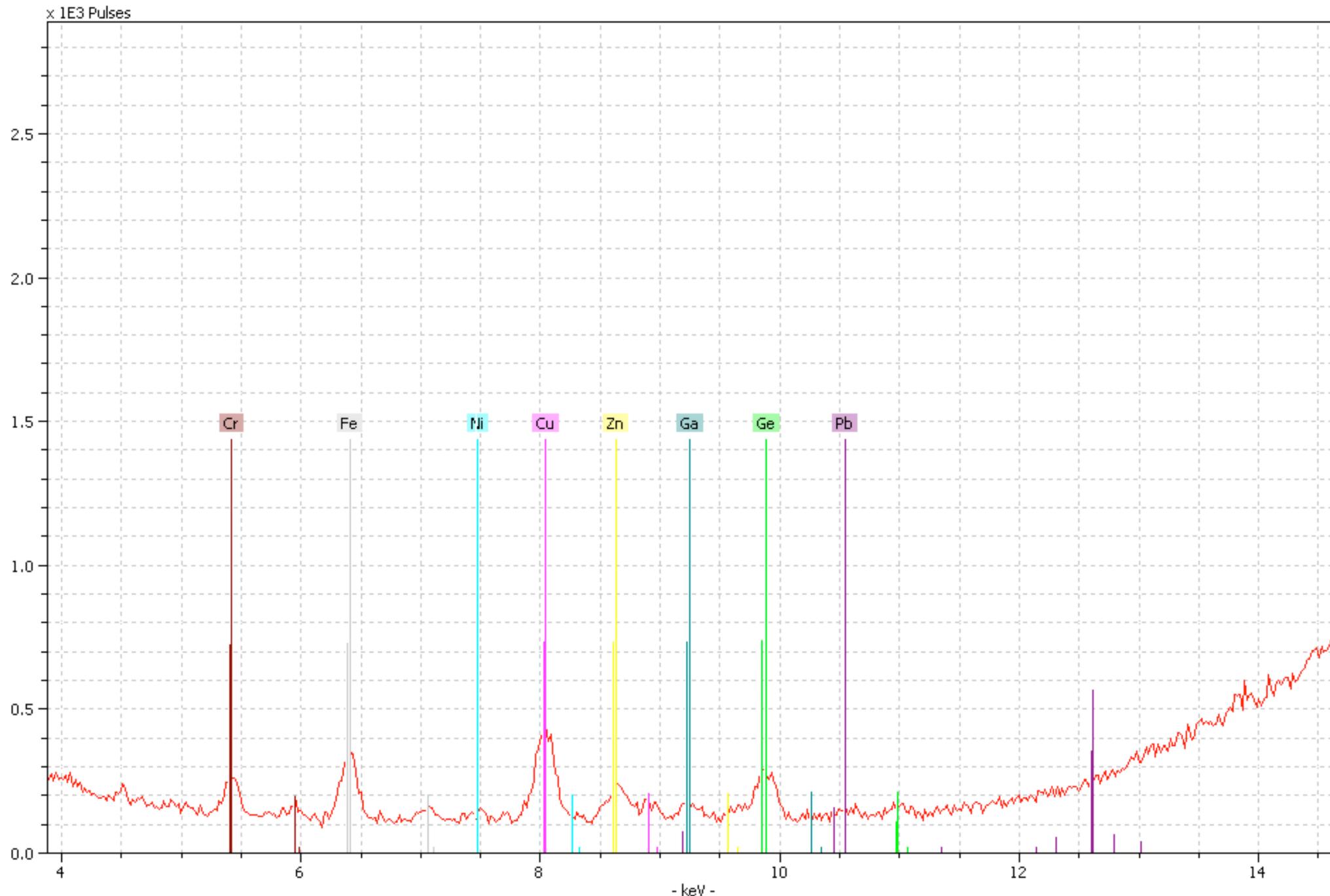
Rubies, unlike Emeralds, are not quite as elementally distinct. However, they still have chromium (Cr), meaning that they must have chromium to be authentic. This can be seen in the spectrum to the left.

Spinel



Spinel has the elemental concentration MgAl_2O_4 . We would expect to see both Aluminum (Al) and Magnesium (Mg). Here, we see both in an authentic piece.

Topaz



Some elements, like Topaz, have no unique elements as identifiers ($\text{Al}_2\text{SiO}_4(\text{F},\text{OH})_2$). In this case, the proportions of elements can be used (twice as much Al relative to Si). Additionally, trace elements can be used to ID specific gems, such as the Germanium (Ge) and Gallium (Ga) in this specimen.