

Raman Spectroscopy in Phosphorites

X-ray Mineral Services in conjunction with its sister lab can produce mineral characterisation maps of polished blocks, polished thin sections and even rough surfaces using confocal Raman spectroscopy. The maps allow for the quantification (by area) of mineral modal abundances.

The image below is of a Neoproterozoic phosphorus-rich rock from Oman. The phosphorus is contained within the fluorapatite-rich matrix that surrounds detrital quartz and rutile grains. Pyrite is also present within the sample, along with minor amounts of albite.

The image provides an example of how Raman spectroscopy can be used to characterise the mineralogy and their textural relationships in phosphorus-rich rocks to gain a better understanding of the ore that is being mined which, in turn, provides insight into the optimal beneficiation processes for such ore. Unlike chemistry-based mapping techniques (e.g., SEM-EDS, microprobe), Raman spectra are influenced by both the chemistry and the structure of the analyte. Therefore, mineral polymorphs such as rutile, brookite and anatase (TiO_2) are easily differentiated.

