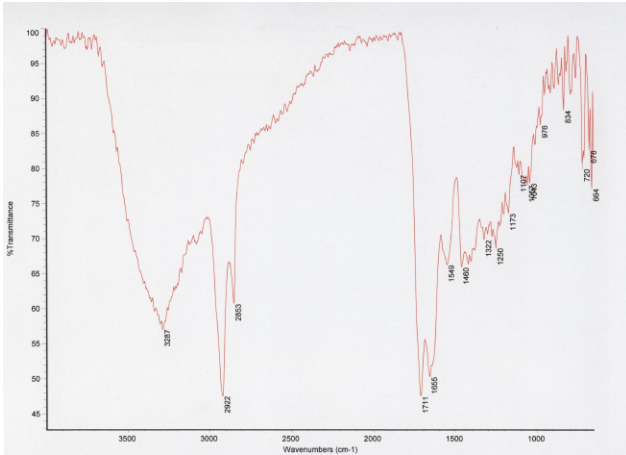


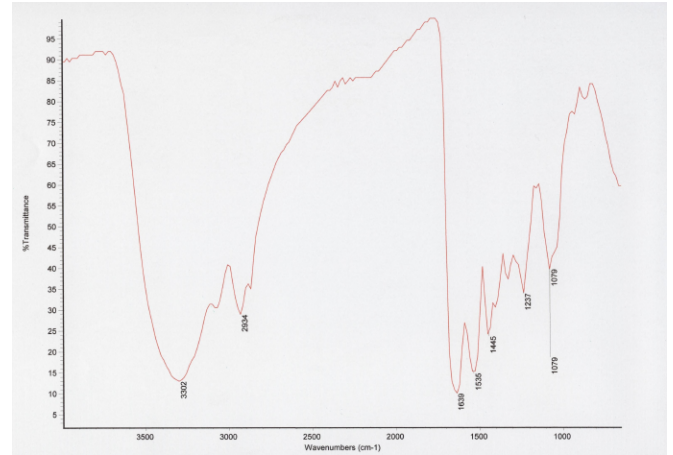
Sample 3

Red (from drapery)

IR



IR spectrum of red sample from drapery



IR reference spectrum sample of proteins typically found in cochineal

Pigment identified:

Cochineal - C₂₂H₂₀O₁₃

For the richer red of the cloth in which the saint holds the monstrance, Lorente Germán employed a pigment called cochineal. It was made from the ground exoskeleton of a Mexican insect that lived off cactus plants. Oaxaca City was the principal center for cochineal production. As with all imports from Spanish colonies, the city of Seville, where Lorente Germán lived and painted, had a monopoly over the European market for this pigment. That monopoly ended in 1777, when a French naturalist smuggled cactus plants with cochineal to Haiti and established rival production plantations.

The elements of cochineal were detected by EDS. Shown here are IR spectrum readings of the red pigment and proteins commonly found in cochineal. By comparing the shape of the troughs in the two spectrums, we are able to determine that this red was from cochineal rather than red ochre or vermilion, which were used elsewhere in this painting