

# Oranges and Apples -- A Comparison

by Scott A. Sandford, NASA Ames Research Center, Mountain View, California

We have all been present at discussions (or arguments) in which one of the combatants attempts to clarify or strengthen a point by comparing the subject at hand with another item or situation more familiar to the audience or opponent. This is generally perceived as being a telling blow to the analogy, since it is generally understood that apples and oranges cannot be compared. However, after being the recipient of just such an accusation, it occurred to me that there are several problems with dismissing analogies with the comparing apples and oranges defense.



Figure 1. Granny Smith Apple and Sunkist Orange

First, the statement that something is like comparing apples and oranges is a kind of analogy itself. That is, denigrating an analogy by accusing it of comparing apples and oranges is, in and of itself, comparing apples and oranges. More importantly, it is not difficult to demonstrate that apples and oranges can, in fact, be compared (see figure 1).

## Materials and Methods

The samples were prepared by desiccating them in a convection oven at low temperature over the course of several days. The dried samples were then mixed with potassium bromide and ground in a small ball-bearing mill for two minutes. One hundred milligrams of each of the resulting powders were then pressed into a circular pellet having a diameter of 1 cm and a thickness of approximately 1 mm. Spectra were taken at a resolution of 1  $\text{cm}^{-1}$  using a Nicolet 740 FTIR spectrometer. Figure 2 shows a comparison of the 4000-400  $\text{cm}^{-1}$  (2.5-25  $\mu\text{m}$ ) infrared transmission spectra of a Granny Smith apple and a Sunkist Navel orange.

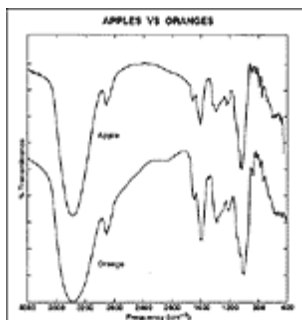


Figure. 2

## Conclusions

Not only was this comparison easy to make, but it is apparent from the figure that apples and oranges are very similar. Thus, it would appear that the comparing apples and oranges defense should no longer be considered valid. This is a somewhat startling revelation. It can be anticipated to have a dramatic effect on the strategies used in arguments and discussions in the future.