It is critical that you properly cite the work of others when you are writing a paper for class, a lab report or a manuscript for publication. In doing so have you ever been tempted to just use a reference from a reference? For example, if a paper you are reading says the structure of compound X was determined to be tetrahedral in reference 15, you don’t actually have to look up reference 15 do you? Consider the following and *caveat lector*.

Background

If you are unfamiliar with the ligand 1,1’-bis(diphenylphosphino)ferrocene, dppf for short, a picture is shown below (Figure 1). It has a ferrocene backbone and is capable of binding to another metal center through the two phosphorus atoms. The dppf ligand is widely used in catalytic systems for a variety of reasons. One reason is that it is a redox active ligand, which means the ferrocene backbone is capable of undergoing oxidation. There are a variety of methods available to examine the valence of the iron in a compound containing dppf. One of those methods is 57Fe Mössbauer spectroscopy which is a technique that measures the absorbance of γ-rays by the compound of interest.

**Figure 1.** dppf



Assignment

The dppf ligand is widely used in a variety of applications which has warranted the publication of several reviews and book chapters. One such chapter is 1,1’-bis(diphenylphosphino)ferrocene – Coordination Chemistry, Organic Synthesis and Catalysis by Kim-Suan Gan and T. S. Andy Hor which is chapter 1 in the book Ferrocenes – Homogeneous Catalysis, Organic Synthesis and Materials Science, Antonio Togni and Tamio Hayashi, Ed., VCH: Weinheim, 1995. While the backbone of dppf is capable of undergoing oxidation, relatively few studies have attempted to isolate the product of that oxidation reaction. There is a short paragraph on page 17 that describes the studies on the oxidation of dppf. The last sentence states “From 57Fe Mössbauer spectroscopy, the [dppf]+ ion is shown to behave like a typical ferrocenium species [28].”

1. Based on reading the previous sentence, what species are the authors describing?
2. Reference 28 (A. Houlton, R. M. G. Roberts, J. Silver, R. V. Parish, *J. Organomet. Chem.* **1991**, *418*, 269.) has been provided. After reading reference 28, do you think it examined the species you answered in the previous question? Why or why not?