Statement: The four terms hypoeutectoid, hypereutectoid, proeutectoid and microconstituent are unnecessary in describing plain carbon steel microstructures and are just part of the natural accumulation of technical terms that arise in any specialist subject.  
  
Answer: Partially wrong:  
  
The best way to answer this question is probably to define each of these technical terms, then take some representative microstructures of carbon steel and try make an accurate description of any of them to see if terms are necessary or not.  
  
First of all, plain carbon steel is iron where the main alloying element is carbon with no particular requirements on any other component. Here is the typical phase diagram for carbon steel.

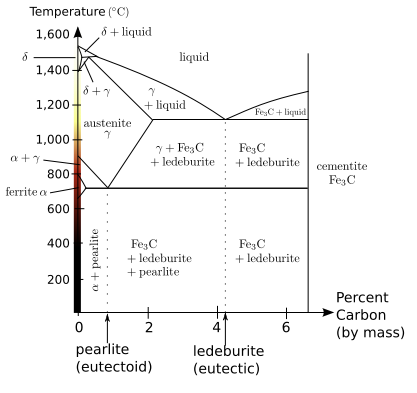
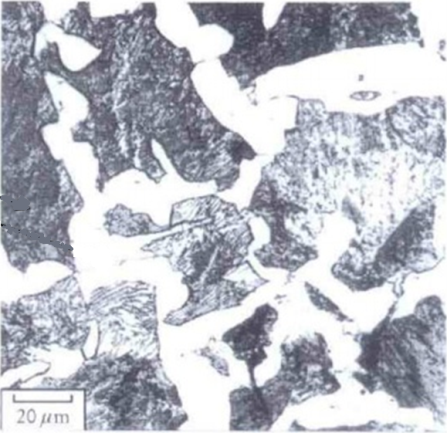


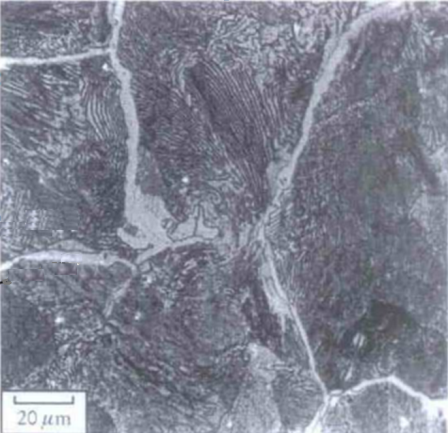
Figure 1: Carbon steel phase diagram.[[1]](#footnote-2)

Important note: Everything that is going to be said here is by using that diagram at equilibrium.  
Considering the three typical terms written in the statement, we can separate carbon steel alloys in typical categories:

* Below 0.77wt% C[[2]](#footnote-3): hypoeutectoid
* Above 0.77 wt% C but below 2.14 wt% C here otherwise this is no longer a carbon steel but a cast iron: hypereutectoid
* Also, proeutectoid means formed at higher temperature than Teutectoid ;

As a consequence, in order to get a bit familiar with these words, at room temperature and at equilibrium, a hypoeutectoid steel will have some proeutectoid ferrite and a hypereutectoid carbon steel will have some proeutectoid cementite in its microstructure.





As a conclusion the important thing to say here is that these terms are only difficult at first look when their meaning is unknown. But when the mechanisms of the carbon steel transformation are well understood they are a great help in describing microstructures. Indeed, there are so many possibilities of different microstructure for that kind of alloy that without them, we would get easily lost.  
Plus, theses terms are universal. This means that we can also use them for a zinc chromium microstructure for example or any other kind of alloy.  
So, yes it is true that we could describe a microstructure by avoiding theses words but it would not be convenient at all.

1. http://en.wikipedia.org/wiki/Image:Steel\_pd.svg, viewed 13 Nov 2008 [↑](#footnote-ref-2)
2. Ashby, M. F., Jones D. R., (2005), *Engineering Materials 2*, Butterworth Heinemann, p. 427 [↑](#footnote-ref-3)