CHAPTER 2

SUPERCRITICAL FLUID & THEIR CHARACTERISTICS

The challenges that the pharmaceutical sector has always faced are primarily due to the finding of new medicines and new technology growth. Supercritical fluid (SCF), a technological procedure that, due to its unique properties such as versatility in usage, reduced environmental concern and simplicity, has become an important instrument in the manufacture of different particulate systems as well as extracting and drying protein and peptides over the last couple of decades.

Super critical fluid

A fluid is called super critical if its pressure and temperature surpass its critical value (Tc – critical temperature and Pc – critical pressure). The crucial point at the top right end and the phase region beyond that point are the SCF region in the phase diagram (figure 1) (Brennecke and Eckert, 1989). Over the Tc, the pressure can't be raised to liquidate a gas. SCF may be liquid or gas, in other words, but is not really one. Another section of the literature presented the physical chemical properties of a SCF as equivalent to those of liquid and gas (Yasuji et al., 2008)

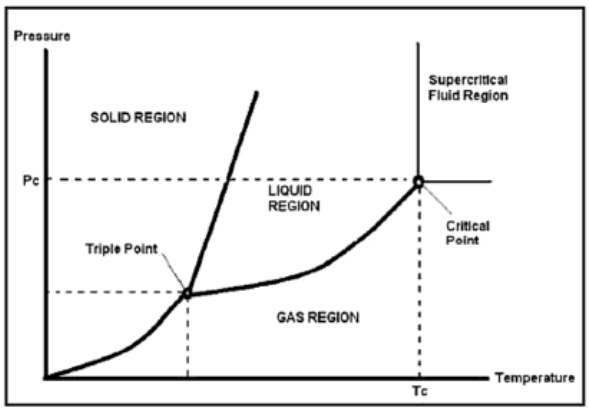

Figure 1: Diagram of supercritical region

All gases can form SCF above particular sets of Pc and Tc values, but the transition to the supercritical state takes place at high temperatures that are not compatible with pharmaceutical compounds (e.g. water) in most cases. In addition, the Pc and Tc