Surface acoustic waves have been used for gas sensing application. Novel layered Surface Acoustic Wave (SAW) based sensors were developed consisting of PIB/36°YXLiNbO3.The 300 nm gas sensitive layer was deposited on lithium niobate (36°YX LiNbO3) substrates. The targeted gas was DCM. This thesis studied the influence of changing the DCM concentration from 100 ppm to 800 ppm, and also the surface roughness. For analyzing the developed SAW gas sensor, the frequency shift was studied and analyzed. In this thesis, the performance of gas sensor was increased significantly. In other words by increasing the number of pillars, the sensor could be able to capture even very small tiny gaseous molecules. The developed SAW sensors' exhibited high response towards DCM when its surface roughness increased. They are capable of sensing concentrations as low as 100 parts-per-billion for DCM