In this study, optimization of different synthesis parameters has been done to synthesize nano niobium carbide (NbC) at low temperature. The NbC is synthesized using niobium penta-oxide (Nb₂O₅), metallic Mg powder and acetone at low temperatures by carbo-thermal route. The XRD pattern shows the confirmation of the obtained phases. The Williamson-Hall analysis is also used to calculate the induced strain in the crystallite. The thermal analysis has been done to analyze the variation in thermal stability of the synthesized product. Electron microscopy micrographs show the agglomeration of obtained nanoparticles and other crystallographic parameters of the single phase NbC.