

## Abstract

The glass is environmental friendly and can be re-cycle many times easily as compared to the plastic which is not bio-degradable in nature. The aim of the research is to manufacture Soda lime-glass with the enriched local & natural raw materials deposits. An effective additive in the glass batch was introduced in the form chemical decolorizer  $CeO_2$  and physical decolorizer  $Nd_2O_3$  by maintaining the redox of the glass batch under the oxidizing conditions. Neodymium oxide nanoparticles are made from its precursor salt neodymium nitrate by the combination of the two techniques Sol/gel and Thermal decomposition which gave the fine particles. The strong oxidizing nature of the cerium along with the niter produce the oxidation condition at the  $1400^\circ C$  while large energy gap ( $5.7eV$ ) of the neodymium oxide makes it ideal to use as the physical decolorizer because it does not change or effected by the redox of the glass melt and compensate the color of the tint of the glass by its own violet color. The glass is doped with both the rare earth metals show its transparency is increased and maximum transmittance is obtained from  $546-562nm$  which is equal to 91% (6.5mm).Due to high transmittance its optical properties increases in the Visible and Near-IR region. Its behavior against the weatherization and solarization is also changed make it excellent UV cut. Maintaining the redox & Ferrous to Ferric ratio will help to decolorize the soda-lime glasses of iron content from 0.1 to 0.3%.