

Physical and optical traits of tellurite glass: effect of bimetallic TiO₂/Au nanoparticles

ABSTRACT

The dependence of TiO₂/Au concentrations on the physical and optical properties of glass was investigated thoroughly. Variations in density, molar volume, molar refraction, refractive index, and polarizability with varying TiO₂/Au contents were affected by the formation of non-bridging oxygen. The formation of big islands in the atomic force microscopy image signifies the growth of nanoparticles. The decrement in band gap manifests alteration in the glass network mainly the local field around the Er³⁺ ions. The rise in Urbach energy illustrates disorder in the glass. The beneficial features of the current glass composition may be useful for photonic devices.