Rare determines the optical properties of rare

Rare earth ions doped glasses are very interesting for solid state laser materials. The determines the optical properties of rare earth ions by the 4f electron shell, it is almost insensitive to the surrounding atom of the host environment because of transmission by 5s and 5p electron shells. The famous one of among rare earth ions is the Dy3+ion is suitable candidate for analyzing the energy-efficient luminescentmaterials 1, 2.

Dysprosium rare earthatoms, Dy which have an active unfilled f shells in its electronicconfiguration (Xe 4f104s2), can provide1. 3 ? m emission due to the 6F11/2, 6H9/2? 6H15/2transition 3. Inaddition, Dy has a good absorption band at approximately 800 nm, at which levela cheap commercial laser diode could be used for excitation. On other hand, the structure of amorphous selenium wasassumed to contain a random mix of selenium chains (Sen) and 8-ringstructures (Se8) distributed randomly throughout the solid. The filled lone pair (LP) p ofSelenium states forms the bonding (s) band while the empty anti-bonding p statesform anti-bonding (s*) band.

The valence band of Se is formed from the lonepair p electrons and the valence s states of Se lie far below thetop of the valence band 4. During crystallization, thechains of Sen and Se8 rings transforms into hexagonal andmonoclinic structure in sequence. The recent Achievements in the growth of chalcogenides doped rare earth ions (RE) studied in last years for active applications of photonic devices such as fiber amplifiers, biosensors, optoelectronic chips, 3D optical recording, luminescent labels, white light up-conversion emission, color display and the near and mid-IR 5-9, The low phonon energy (<500 cm-1) and high refractive indices of chalcogenides

glasses hosts bring about high quantum efficiencies for rare earth ions transitions and larger oscillator strengths of RE dopants 10, 11.