

Introduction a The transparent conducting oxides (TCOs) are an exceptional class of semiconductors, which have ability of being transparent to visible light with a good conductivity. Therefore, in this study, we present the structural, electronic, and optical properties of SnO₂ doped with fluorine (F) and chlorine (Cl) using DFT calculations. To further improve its conducting performance by doping without affecting its high transparency, a deep understanding of the effects of dopants on the physical properties of SnO₂ is essential. Among the TCOs, tin dioxide (SnO₂) exhibits a high chemical, mechanical, and thermal stability and low cost. These two characteristics make them attractive materials to use in various .[technological applications [1