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Band Gap Engineering in SnO₂ by Pb dopingS. N. Sarangi,^{1,2} Gopal K Pradhan^{1*} and D. Samal^{1,2*}¹Institute of Physics, Sachivalaya Marg, Bhubaneswar-751005, India²Homi Bhabha National Institute, Anushakti Nagar, Mumbai 400085, India**Abstract**

There is a growing need to lower the band gap of the transparent conductive tin oxide (SnO₂) in view of its potential application in photo-electronic technology. Here, we systematically investigated the effect of Pb doping on lowering the band gap of SnO₂. We demonstrate a significant reduction in its band gap to as much as ~ 0.8 eV (3.64 eV to 2.87 eV) upon 15% Pb doping. The observed band gap tunability with Pb-incorporation provides a direct and efficient approach to effectively tailor the band gap and is expected to open up applications in emerging oxide opto-electronic and energy applications.

KEYWORDS: Transparent conductive oxides, Band gap engineering, Pb doped SnO₂, Dirac material.

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