

# Enhancement in optical, mechanical, thermal and electrical properties of organic crystals by selective dye doping

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A dye is an organic aromatic chemical group which can be incorporated into organic crystals during their growth which can result in marked improvement in various properties of the crystals [1-2]. Some popular dyes used for the purpose are Xylenol orange (XO), sunset yellow (SSY), Trypan blue (TB) which are used to tune optical band gap, photoluminescence, thermal stability, mechanical strength, dielectric and piezoelectric properties of various organic crystals.

In the present work we summarize our results in respect of the effect of various dye doping in organic crystals like triglycine sulphate (TGS), potassium hydrogen phthalate (KAP), ammonium dihydrogen phosphate (ADP), Benzophenon (BZ), ammonium dihydrogen phosphate (ADP), etc [3-6]. These dye doping resulted in the change in the optical band gap, photoluminescence peak position and intensity, SHG efficiency which can be used for various optical applications of the crystals. The dielectric constant and the transition temperature were also found to change which were used to tune the output frequency of patch antenna in GHz applications. Improvement in the piezoelectric charge coefficient ( $d_{33}$  pC/N) were achieved by dye doping in many crystals which can improve the performance on piezoelectric energy harvesters. The observed enhancement of mechanical (microhardness) and thermal (increased ferroelectric transition temperature) can further improve the quality and range of optical and electrical devices as a result of dye doping.

## Reference

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