

### **403a Modifying Bandgap of TiO<sub>2</sub>-Based Nanoparticles by Cation Doping**

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Doping of foreign elements is a common practice in modifying the bandgap of semiconductors. This is especially important in photocatalysis where undoped TiO<sub>2</sub> can only be activated by light energy equal to or greater than 3.2 eV i.e. ultraviolet. Such energy range is unfortunately present in less than 3% of the solar spectrum. In this work, attempts to synthesise cation-doped (Fe, V, Mn and Co) TiO<sub>2</sub> with bandgap energy less than 3.2 eV is demonstrated via a one-step Flame Spray Pyrolysis technique. Doping cations into TiO<sub>2</sub> lattice creates impurity energy level in the original bandgap hence allowing for photoresponse at lower energy or by visible light. The amount of each dopant was varied between 0.5 to 30 atom% and its effects on the bandgap energy and other physicochemical properties were investigated.