EFFECTS OF IONS IRRADIATION ON TIO₂ NANOPARTICLES: A REVIEW

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It is obvious that the physical properties of nanomaterials could be tuned to induced defects or phase transformation using physical or chemical methods. In this review, a physical method of ions irradiation induced tuning the physical properties of TiO_2 nanoparticles (NPs) is presented. Effects of different ions species on TiO_2 NPs at different fluences and substrate temperature were fully reviewed. Ion irradiation induced two phenomena; ions-induced-defects production and ion-induced-phase transformation were fully investigated. Moreover, ion-beam-induced-mixing of TiO_2 NPs at contact points which cause coalescence of TiO_2 NPs were also illustrated in this review. Finally, results were summarised and fully investigated the irradiation issues on latest ion irradiation research on TiO_2 NPs and future way forward to solve these issues are highlighted in this review paper.