

Effect of Gamma Radiation on Bromophenol Blue Dyed Films as Dosimeter

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Abstract : Ionizing radiation can cause a drastic change in the physical and chemical properties of the material exposed. Numerous medical devices are sterilized by ionizing radiation. In the current research paper, an attempt was made to develop precise and inexpensive polymeric film dosimeter which can be used for controlling radiation dosage. Polymeric film containing (pH sensitive dye) indicator dye Bromophenol blue (BPB) was casted to check the effect of Gamma radiation on its optical and physical properties. The film was exposed to gamma radiation at 4 kGy/hr in the range of 0 to 300 kGy at an interval of 50 kGy. Release of vinyl acetate from an emulsion on high radiation reacts with the BPB fading the color of the film from blue to light blue and then finally colorless, indicating a change in pH from basic to acidic form. The change was characterized by using CIE $l^*a^*b^*$, ultra-violet spectroscopy and FT-IR respectively.

Keywords : bromophenol blue, dosimeter, gamma radiation, polymer

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