

POLYMER OPTICAL FIBRE FOR IN SITU MONITORING OF GAMMA RADIATION PROCESSES

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Abstract- Poly Methyl MethAcrylate (PMMA) based plastic optical fibres offer a low cost radiation monitoring solution with a wide dose range, capable of providing real-time, online information. The sensitivity of the fibre to ionising radiation is shown to be dependant on wavelength, with the sensitivity increasing with decreasing wavelength, and so by carefully selecting the monitoring wavelength, the desired sensitivity and dose range can be achieved. The fibres exhibit high sensitivity, up to 0.6dBm- 1/kGy, and are capable of monitoring dose ranges between 30Gy and 45kGy. This exceeds the sensing range of all commercially available PMMA slab sensors, allowing it to be used for a wide range of applications.

Index terms: Radiation dosimetry, Plastic Optical Fibres, Optical Fibre Sensors, radiation processes