Results: The fluorescence response increased linearly with the absorbed dose from 0 to 200 Gy. The absorbance also increased linearly, indicating that the fluorescent dye is the only chemical in the material with a significant absorption in the relevant wavelength range. The dye absorbs from 500 nm to 575 nm and the fluorescence response is in the range from 565 nm to 650 nm.

Conclusion: We have established that the material exhibits a linear relationship between fluorescence response and radiation dose. The fluorescence response is strong enough to be used at low doses. Measurements on individual samples are highly reproducible, but the variance between different samples is still too high to be used at clinically relevant doses. We expect that this variance can be reduced through improvements to the sample preparation. The fluorescence response of the radiochromic dye is highly dependent on the composition of the polymer matrix, since a different study[3] using the same dye observed a decrease in fluorescence with increasing dose. The factors affecting the fluorescence of the dye and hence its dosimetric properties are still being investigated, but in this work we have shown that dosimetry measurements are possible with this novel material. With improvements this could become a precise quantitative 3D dosimeter that is inexpensive, quick, and easy to use.


Conclusion: In conclusion TRS-398 gives relatively high doses than TG-51 and the percentage difference increases as the energy increases for photon beams. While in case of electron beams TG-51 calculates relatively high doses than TRS-398 and percentage difference decreases as the energy increases. Since the chambers are calibrated according to the recommendations of IAEA TRS-398 Dosimetry protocol, all the medical centres are requested to follow the IAEA TRS-398 Dosimetry protocols.