**ABSTRACT**

Dye-sensitized solar cells (DSSC) were fabricated with dyes extracted from the leaves of *Amaranthus red* and *Lawsonia inermis* (Henna). A total of ten dyes were synthesized using solvents like distilled water, acetone and ethanol. UV–Vis spectroscopy was taken for all the dyes prepared. FTIR was taken for the dyes which had maximum absorption in the visible region. FTO substrates coated with nanosized TiO2 sensitized with dyes extracted were the photoanodes. Counter cathode was primed using graphene-coated FTO films. Two solar cells have been made up with the efficient dyes prepared from Amaranthus and Henna.*J*–*V* characterization performed for the cells showed that the solar cell fabricated with Amaranthus dye was efficient with the photoconversion efficiency and fill factor of 0.14% and 0.3864, respectively, compared to the cells fabricated using Henna dye whose photoconversion efficiency and fill factor are 0.09% and 0.3851, respectively.