**ABSTRACT**

As a step of environmental protection by waste management, fresh and dried leaves of Prosopis juliflora were utilised in preparing natural dyes with ethanol and acetone as solvents and were made use as sensitizers in Dye-Sensitized Solar Cells (DSSC). Four dyes were taken in total, UV–Vis and FTIR spectroscopic studies were performed for the prepared dye sensitizers. J-V Characterization study was carried out for the fabricated cells and important parameters like Short-circuit current (Jsc), open-circuit voltage (Voc), fill-factor (FF) and photo-conversion efficiency were determined. It was seen that the cell with dye extracted from dried leaves using acetone as solvent showed the highest photo-conversion efficiency of 0.322 % among the four cells fabricated. While the cells prepared with the fresh leaves showed an efficiency of 0.017 % and 0.225 % with ethanol and acetone respectively and the cell with the dye taken from the dried leaves using ethanol solvent exhibited an efficiency of 0.058 %.