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Abstract	:	The Zn/Co catalyst was synthesized by utilization of kalanchoe pinnata leaves extract as new sources of green electrolyte via electrochemical method for photocatalytic CO2 reduction. The physico-chemical properties of the prepared catalyst were established and identified using the Fourier-Transform Infrared Spectroscopy (FTIR) which showed that band at 487 cm−1 is indicated as the stretching mode of ZnO while 669 cm−1 related to the Co2+ vibration in the tetrahedral hole which validate the formation and purity of synthesized catalyst. As to evaluate the catalyst performance and determine the optimum catalyst operating condition, a simple batch photoreactor system was conducted which involved several testings such as effect of reaction temperature and pressure, effect of catalyst loading, and effect of reaction time which conducted under 18 watt of light irradiation. The results demonstrate that 93.3% of CO2 was reducted as measured using the gas chromatograph.