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Abstract
This research mainly focused on the fabrication of nano titanium dioxide（TiO2）thin film electrode and the infusing of electrolyte for nano-organic solar cell（NOSC）. Two kinds of organic dyes were used in NOSC to test their performance by measuring the voltage and current when exposed them under the sunlight. Furthermore, the fundamental principle, composed structure, the characteristics of organic dyes and the energy conversion efficiency of NOSC were introduced and analyzed. The feasibility and practicability about the NOSC in the future were also discussed.

The fabrication method revealed in this study to produce the thin film electrode on conductive glass from nano TiO2 powders was called “Spray Vaporization Film-Growth（SVF）” method. The manufacturing procedure is to mix nano scale TiO2 powders with suitable amount of liquid, then the TiO2 mixture solution was injected from high pressure spray gun. The nebulized mixture was deposited on the heated conductive glass, and the TiO2 powders were soon sintered as thin film, when the liquid was vaporized. The method only need to heat conductive glass to 280℃ and take two minutes to form a sintered thin film electrode, compared with the other method, which need to heat conductive glass to 450℃ and take thirty minutes to form thin film. Therefore, the method used in this study may reduce the cost to fabricate TiO2 thin film electrode.

On the infusing of electrolyte, this research used capillary force to fill electrolyte into the narrow space, which formed by two pieces of conductive glasses, each of them has thin film electrode on its side. The electrolyte was filled from the bottom edge to the top edge of the narrow space. However, the traditional method of infusing electrolyte needs to drill a hole on one glass surface as filling entrance. After the electrolyte was infused, the hole was sealed by UV glue. The new method does not need to drill any hole that seems to be more convenient and provide better appearance of solar cell.

Besides, this research tested two kinds of organic dyes, which was extracted from plants. They were caffeine（C8H10N4O2）and chlorophyll（C55H70O6N4Mg）. The results show the chlorophyll provides better power performance for NOSC than the caffeine does.
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