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LIST OF SYMBOLS AND ABBREVIATIONS

PCE	Power conversion efficiency
DSCs	Dye-sensitized solar cells
PE	Photoelectrode
CE	Counterelectrode
EL	Electrolyte
TCO	Transparent conducting oxide
HOMO	The highest occupied molecular orbital
LUMO	The lowest unoccupied molecular orbital
CB	conduction band
J_{sc}	Short-circuit current density
FF	Fill factor
V_{oc}	Open-circuit voltage
J	Current density
V	Voltage
P_{in}	Power of incident solar spectrum
P_{max}	Maximum power
J_{max}	Maximum current density
V_{max}	Maximum voltage
P_{theory}	Theoretical power
LHE, Φ_{LH}	Light harvesting efficiency
SSA	Specific surface area
FTO	Fluorine-doped tin oxide
PEG	Polyethylene glycol
FE-SEM	Field-emission scanning electron microscopy
EY	Eosin-Y
Φ_G	Electron generation efficiency
Φ_C	Charge collection efficiency

EIS	Electrochemical impedance spectroscopy
R_s	Series resistance
R_{ct}	Charge transfer resistance
CPE	Constant phase element
R_{rec}	Recombination resistance
R	Gas constant
T	Absolute temperature
F	Faraday's constant
J_0	Exchange current density
τ	Electron life time
f_{peak}	The frequency at the maximum peak from the Bode phase plots
IPCE	Incident photon to current efficiency
C	Capacitor
EQE	External quantum efficiency

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ข้อความแห่งการริเริ่ม

1. กระบวนการปรับปรุงพื้นผิวทางเคมีซึ่งประกอบด้วยกระบวนการแบบสารละลายและแบบไอเชิงเคมีมีศักยภาพที่จะดัดแปลงฟิล์มพอลิเมอร์ซึ่งกึ่งออกไซด์สำหรับการประยุกต์ใช้ในเซลล์แสงอาทิตย์ชนิดสีขมไวแสง
2. การดัดแปลงพื้นผิวฟิล์มซึ่งกึ่งออกไซด์ด้วยกระบวนการไอเชิงเคมีได้ถูกสาธิตเป็นครั้งแรกในงานวิจัยนี้สำหรับการเพิ่มประสิทธิภาพเซลล์แสงอาทิตย์ชนิดสีขมไวแสง
3. การเพิ่มประสิทธิภาพเซลล์แสงอาทิตย์ชนิดสีขมไวแสงสามารถอธิบายได้โดยการเพิ่มการดูดซับสีขมซึ่งเป็นผลมาจากการปรับปรุงฟิล์มพอลิเมอร์ซึ่งกึ่งออกไซด์



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STATEMENT OF ORIGINALITY

1. Chemical texturing processes including wet and vapor texturing process have ability to modify porous ZnO films for dye-sensitized solar cells.
2. Surface modification of porous ZnO films via chemical vapor texturing process is demonstrated for the first time in this work for power conversion efficiency enhancement of dye-sensitized solar cell.
3. The power conversion efficiency enhancement of dye-sensitized solar cells can be explained by increasing of dye adsorption due to modified porous ZnO films.



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