



Dye-sensitized solar cells with PVA-KI-EC-PC gel electrolytes

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| Mots-clés | Conductivity [5], PVA-based gel electrolyte [6], Solar cell efficiency [7] |
| Résumé en anglais | <p>Gel polymer electrolytes consisting of PVA-EC-PC-KI have been studied in this work. The highest room temperature (298 K) conductivity of 12.92 mS cm⁻¹ is obtained for PVA-based gel polymer electrolyte (GPE) with composition 14.5 PVA-21.7 EC-28.7 PC-30.4 KI-4.7 I₂ (in wt%). The high conductivity is due to the highest number density of mobile ions in the electrolyte. The conductivity-temperature dependence follows the Vogel-Tamman-Fulcher (VTF) relationship. The trend of pseudoactivation energy (E_a) with salt concentration is contrary to that of conductivity. PVA-based GPEs with 5 to 35 wt% KI were used as a medium in ruthenium 535 (N719) dye-sensitized solar cells. The efficiency (η) of the solar cells increased as the composition of KI salt in the electrolyte increased. The highest power conversion efficiency of 2.74 % is obtained for solar cells fabricated with electrolyte containing 35 wt% KI. The variation of efficiency follows the same trend as short circuit current density (J_{sc}). The increase in J_{sc} is influenced by the increase in iodide ion concentration in the electrolyte that assists the redox process and helps electron to shuttle between ionized dye and counter electrode.</p> |
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[1] [http://okina.univ-angers.fr/publications?f\[author\]=20822](http://okina.univ-angers.fr/publications?f[author]=20822)

[2] [http://okina.univ-angers.fr/publications?f\[author\]=20823](http://okina.univ-angers.fr/publications?f[author]=20823)

- [3] <http://okina.univ-angers.fr/bouchta.sahraoui/publications>
- [4] [http://okina.univ-angers.fr/publications?f\[author\]=20833](http://okina.univ-angers.fr/publications?f[author]=20833)
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- [6] [http://okina.univ-angers.fr/publications?f\[keyword\]=17765](http://okina.univ-angers.fr/publications?f[keyword]=17765)
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