Highly efficient transparent liquid junction photovoltaic devices created by means of dry plasma reduction

다오반†, 최호석
충남대학교
(duongdaovan@cnu.ac.kr†)

Due to their superior properties compared with pure counterparts, the nanohybrid materials have garnered significant attention to many fields such as optical materials, catalysis, energy conversion, and energy storage. So far, many attempts for synthesizing nanohybrid materials have been made through chemical methods or physical methods. However, the previous methods have some drawbacks such as a high reduction rate during chemical reduction, long cooling time and nanoparticles' agglomeration owing to high-temperature reduction and expensive equipment, rendering it difficult to develop an economic and continuous process. The aim of this study is to develop a new process of efficiently synthesizing nanohybrid materials under atmospheric pressure, at near room temperature, with applying quick process and without using toxic chemicals. First, we show successful syntheses of various nanohybrid materials using atmospheric pressure plasma reduction. The developed nanohybrid materials are applied in transparent liquid-junction photovoltaic devices.

Keywords: dry plasma reduction, dye-sensitized solar cells, nanohybrid materials, counter electrode.