

Organic Photovoltaic: current status, leadership and real world applications

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Printable organic photovoltaic solar cells (OPV), i.e. polymer solar cells, have now reached impressive power conversion efficiencies at lab scale over 20%. It is one crucial milestone towards the deployment of OPV products in real life. OPV holds many promises including potential low cost, large scale, low temperature processing, low energy payback time, low carbon footprint for the production of photovoltaic modules exempt of critical raw materials. However, today, not all are yet scientifically achieved. For example, commercially available OPV modules suffer from low PCE, from 3 to 5 % (30-50 Wp/m²) and are made with still costly raw materials mostly processed from toxic organic solvents. It is a matter of time for the industrial players to catch up with recent academic research to push industrial OPV performances further. This presentation will attempt to discuss the state-of-the-art and the challenges that OPV is facing. A focus will be given to a recent economical study of the leadership dynamics over the last 20 years, in emerging solar research, to illustrate the chinese supremacy on this field. The presentation will end showing unpublished results obtained while monitoring OPV-powered fabrics in various outdoor real world conditions.

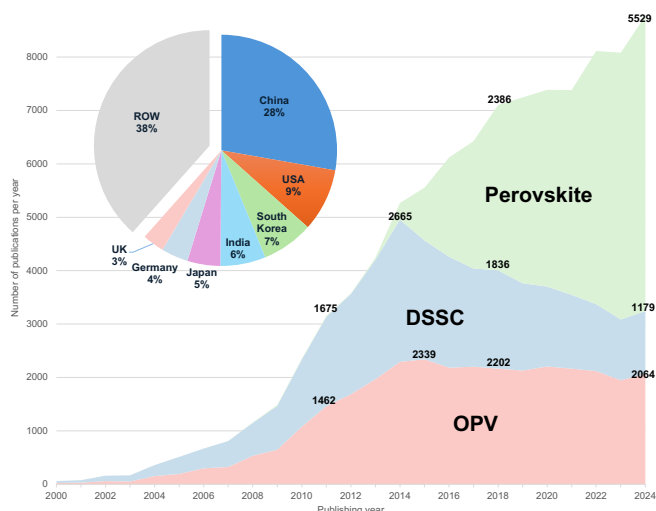


Figure 1 Annual global scientific publications in peer-reviewed international journals related to the three main emerging photovoltaic technologies: perovskite, DSSC, and OPV. The inset shows the historical share of publications for the leading countries.