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Abstract

Many types of nanogenerators (NGs) have been developed in a rapid pace, the technological focus and trends of this fantastic emerging technology deserve in-depth exploration. This paper presents the outcomes of a technology roadmapping study based on the research on existing position of NGs. An integrating approach that combines bibliometrics, patent analysis and technology roadmapping method (TRM) workshops was applied. The bibliometrics and patent analysis provide a means of visualizing detailed information about the past trajectory and technological focus of the NGs technology. Its results show that China has been with the international forefront regard to research into NGs since 2013, especially in the field of triboelectric nanogenerators (TENG). Based on these quantitative results, key external factors which may shape the growth of NGs-based industry have been identified according to the experts’ opinions. Finally, the future development

\footnote{B. Wang and Y. Liu contributed equally to this work.}
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