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## Electroactive polymers for ocean kinetic energy harvesting

The recent issue of serious global warming has stimulated research on the development of de-carbonized energy harvesting technologies. The ocean has the most valuable natural resources which have resulted in the construction of a wide variety of offshore plants all over the world. Because nearly all offshore plants are stand-alone plants that do not transmit electricity, they must have their own power generators. This paper aims to provide a source of information on ocean kinetic energy harvesting with electroactive polymers from the natural oscillations of ocean waves and currents. Electroactive polymers play an important role due to having electricity generation characteristics that correspond to mechanical stimuli. Among them, dielectric elastomers and piezoelectric materials have shown considerable promise for harvesting energy from environmental sources, such as ocean waves and currents. Ionic polymer metal composites, which are known as ionic electroactive polymers, are emerging materials in energy harvesting applications because of their favorable electromechanical characteristics and their highly compliant nature. Moreover, their intimacy with water enables them to be used in a water environment, which is suitable for ocean energy harvesting. Electroactive harvesting for the ocean kinetic energy has the potential to coexist with marine environments.

### Biography

Hyung-Man Kim is currently Chair Professor of Mechanical Engineering at INJE University and the Director of the National Leading Research Laboratory of regenerative fuel cell. His academic career started with a Bachelor's and a Master's degree, both in Mechanical Engineering from Seoul National University, Korea, followed by a Ph.D. degree at the University of Tokyo, Japan, in 1997. Professor Kim is an internationally renowned expert in energy engineering and is distinguished for his seminal contributions in the areas of fuel cells, multi-scale multiphase heat and mass transport with electrochemical reactions, computational modeling, integration and control of regenerative fuel cell with photovoltaic cell, renewable energy of ocean kinetic energy harvester, distributed generation, smart grid, and sustainable energy for global environment. He is an author/co-author of over 100 journal papers. His scientific research has been recognized by many recent awards, including ISE Fellow Award, the INJE Distinguished Scholar Award, and Academic Award for the Fuel Cell Research Achievement. In addition to his scholastic achievements with outstanding research credential, he has also received many teaching excellence awards, including the Award for the student mentoring at Teacher's day and Grand Prize of the Regional Brain-Korea 21 Directors from Ministry of Education and Science, Korea. In the international community, Prof. Kim has served as reviewer and has been a member of the editorial board for more than 20 international journals.

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