



Battery makers win Nobel Chemistry Prize

October 10, 2019

Three scientists have won a Nobel Prize for their invention of rechargeable lithium-ion batteries.



1-1. The men behind the lithium-ion batteries we use in everything we use

1-2. have won the Nobel prize

ROYAL SWEDISH ACADEMY OF SCIENCES SECRETARY GENERAL, GORAN K. HANSSON, SAYING:

"The Royal Swedish Academy of Sciences has today decided to award the 2019 Nobel prize in chemistry jointly to John B. Goodenough, M. Stanley Whittingham and Akira Yoshino."

2. Their rechargeable battery

3-1. It's also used in electric cars, and

3-2. making

4-1. British scientist Stanley Whittingham made the world's

4-2. then the following decade

5. Japan's Akira Yoshino then removed any pure lithium from the battery,

6. Speaking on the phone at today's press conference, he said _____

7. They've been awarded _____

8-1. It's not the first science prize _____

8-2. but at 97 _____

[Vocabulary]

□ **lithium-ion battery**: a type of rechargeable battery. Lithium-ion batteries are commonly used for portable electronics and electric vehicles and are growing in popularity for military and aerospace applications. The technology was largely developed by John Goodenough, Stanley Whittingham, and Akira Yoshino during the 1970s–1980s, and then commercialized by a Sony and Asahi Kasei team led by Yoshio Nishi in 1991.

□ **Royal Swedish Academy of Sciences**: one of the royal academies of Sweden. Founded on June 2, 1739, it is an independent, non-governmental scientific organization which takes special responsibility for promoting the natural sciences and mathematics and strengthen their influence in society, whilst endeavoring to promote the exchange of ideas between various disciplines.

□ **award**: to give someone a prize or other reward because they have achieved something

• *The prize is awarded annually.*

• *Students who complete the training successfully will be awarded a diploma.*

□ **John B. Goodenough**: (born July 25, 1922) A Nobel laureate in chemistry, he is a professor of mechanical engineering and materials science at the University of Texas at Austin. He is widely credited with the identification and development of the lithium-ion battery, for developing the Goodenough–Kanamori rules in determining the sign of the magnetic superexchange in materials, and for seminal developments in computer random access memory.

□ **M. Stanley Whittingham**: (born 1941) is a British-American chemist. He is currently a professor of chemistry and director of both the Institute for Materials Research and the Materials Science and Engineering program at Binghamton University, part of the State University of New York. He was awarded the Nobel Prize in Chemistry in 2019. he is called Founding Father of rechargeable lithium batteries.

□ **recharge**: to restore electrical energy in (a battery or a battery-operated device) by connecting it to a power supply.

□ **rechargeable**: Rechargeable batteries can be recharged and used again. Some electrical products are described as rechargeable when they contain rechargeable batteries.

□ **foundation**: the most basic part of something from which the rest of it develops

□ **electronics**: electronic equipment, or equipment with electronic parts

□ **wireless electronics**:

□ **mobile phone**: a hand-held mobile radiotelephone for use in an area divided into small sections (cells), each with its own short-range transmitter/receiver

□ **laptop**: a small computer that you can carry with you

- **store:** to keep something in a particular place
 - *Store the cake in an airtight container.*
 - *Nuclear waste is currently being stored close to the town.*
- **renewable:** (of a natural resource or source of energy) not depleted when used
- **renewable source:** renewable sources
- **fossil:** an animal or plant, or a part of one, that lived many thousands of years ago and is preserved in rock or as a piece of rock
- **-free:** used with many nouns to make adjectives meaning without a particular thing
 - *foods that are almost fat-free*
 - *Switching to fat-free milk is an easy way to a lower fat diet.*
- **fossil-free:**
- **function:** to work or operate in the correct or normal way
 - *My brain isn't functioning today.*
 - *His new kidney began functioning immediately.*
- **lithium:** a very soft silver-white metal that is lighter than all other metals, and its symbol is Li.
- **lithium battery:** primary batteries that have metallic lithium as an anode. These types of batteries are also referred to as lithium-metal batteries.
- **remove:** to take something or someone away from a place; to get rid of a problem, difficulty, or something that annoys you
 - *Rescue crews removed two people from the collapsed building.*
 - *Remove the pan from the heat and leave to cool.*
- **press conference:** a conference at which press and tv reporters ask questions of a politician or other celebrity
- **curiosity:** a strong feeling of wanting to find out about something
 - *The curiosity is killing me.*
 - *What's in the box? We're dying of curiosity.*
- **driving force:** the act of applying force to propel something
 - *After reaching the desired velocity the drive is cut off.*

[参照辞書: Merriam-Webster, Oxford English Dictionary, America Heritage of the English language, Collins English Dictionary, Macmillan Dictionary, the Free Dictionary, Wikipedia]