



LIVES OF THE GREAT GEOCHEMISTS: KATSUKO SARUHASHI

"There are a lot of reasons why women don't go into science. The lack of equal opportunity is one. There is also the attitude of society, of parents and teachers. And there is little recognition of the contributions of women scientists".¹



These words are from the then 73-year-old Katsuko Saruhashi, a Japanese-born geochemist who pioneered the measurement of CO₂ in ocean water. Saruhashi was born on March 22, 1920, in Tokyo, Japan, and while her parents were supportive of her education, this didn't necessarily include a higher education degree. She quit her job at an insurance company to attend the Imperial Women's College of Science, now Toho University, at the age of 21, graduating with a degree in chemistry in 1943.

At first, Saruhashi struggled with a lack of equipment, but Yasuo Miyake, who became an important mentor, arranged for Saruhashi to use the government lab facilities. She later said of Miyake that, for him, it didn't matter if a researcher was a man or a woman if they showed determination and commitment to pursuing problems.

Saruhashi then joined the Geochemical Laboratory of the now Japan Meteorological Agency on Miyake's research team. There she started measuring CO₂ from Pacific waters, at a time when no one paid any attention to the problem. Saruhashi had to develop her own measuring system, known as Saruhashi's Table, in which carbon dioxide is determined based on three parameters: temperature, pH, and chlorinity.² This work earned her a PhD at Tokyo University in 1957.

Another important contribution was made when Japanese fishermen became mysteriously ill after being downwind of Bikini Atoll, where the US carried out nuclear tests until 1958. That led Saruhashi to carry out measurements of nuclear contaminant fallout to the ocean;

a stupendous task given the tiny amounts in an immense body of water. She was able to prove that fallout from tests reached Japan in just 18 months and showed how radiation would disperse in the atmosphere and the ocean, raising concerns about contamination of the Pacific.

As we can gather from her words at the beginning of this text, Saruhashi was deeply concerned about the lack of recognition for women in science. In 1958, she established the Society of Japanese Women Scientists. In 1980, Saruhashi was the first woman elected to the Science Council of Japan, and in 1981, she established the Saruhashi Prize, given each year to a woman who can serve as a role model for young female researchers. This is a small prize funded primarily by Saruhashi and money raised by her co-workers after she retired from the Geochemical Research Laboratory, where she had been director since 1979.

Katsuko Saruhashi died, at the age of 87, in Tokyo, Japan, on September 29, 2007.

REFERENCES

- 1 Quote published in Normile D (1993) A prize of one's one. Science 260: 424, doi: 10.1126/science.260.5106.424
- 2 Saruhashi K (1955) On the equilibrium concentration ratio of carbonic acid substances dissolved in natural water. Papers in Meteorology and Geophysics 6: 38-55, doi: 10.2467/mripapers1950.6.1_38

FURTHER READING

- Hatakeyama S. (2016) A life story of Saruhashi Katsuko (1920-2007), Nov 30, 2016, <https://japanfeministdebates.wordpress.com/2016/11/30/a-life-story-of-saruhashi-katsuko-1920-2007/> (accessed in August 2022)
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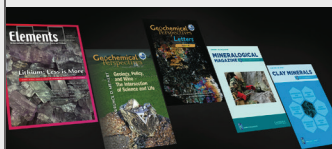


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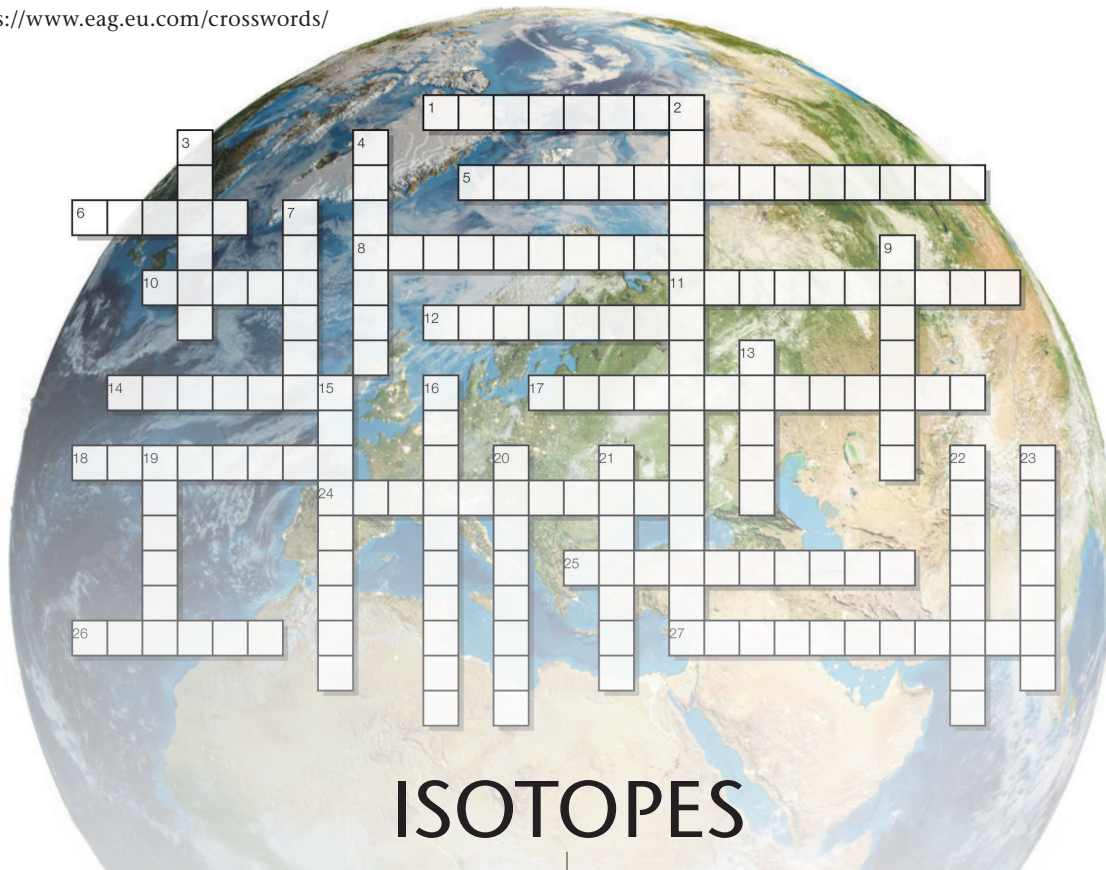
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ISOTOPES

ACROSS

- 1 Parent of a classical radiogenic isotope system.
- 5 Isotope anomalies inherited from stars.
- 6 Process by which an unstable atomic nucleus loses energy.
- 8 Unreactive elements with useful isotopes.
- 10 The animal in charge of the pack.
- 11 Source of an object.
- 12 $\ln 2 / \lambda$.
- 14 Not religious.
- 17 Separates parents and daughters.
- 18 Difference between two isotopes of an element.
- 24 A state of balance.
- 25 Can be studied using $\delta^7\text{Li}$, $\delta^{26}\text{Mg}$, $^{87}\text{Sr}/^{86}\text{Sr}$...
- 26 Tinder for geochemists.
- 27 Nobody seems keen to have this type of waste dumped near their town.

DOWN

- 2 Every isotope geochemist's favourite tool.
- 3 In the 2017, UK general election, Theresa May claimed to be strong and _____.
- 4 Parent of platinum-group isotope system.
- 7 Ionised gas.
- 9 Parent of a short-lived radiochronometer.
- 13 Stable isotopes of this element trace ocean pH.
- 15 Real or hypothetical (isotopic) pool.
- 16 Daughter of a radioactive nuclide.
- 19 Can be studied using fission tracks, U-Th-He.
- 20 Glows hot to ionise.
- 21 Isotope fractionation style.
- 22 Canonical distillation model.
- 23 Isotope system for rates of processes.

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