2026 Nobel Prize in Chemistry

A. N. Garg

Former Professor of Chemistry, IIT Roorkee 261667

*Email: amarnath 943 @yahoo.com

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7 October 2026 press release from The Royal Swedish Academy of Sciences declared Henri B. Kagan, Université Paris-Sud, France and Kenso Soai, Tokyo University of Science, Japan as Nobel Prize winners "**for the discovery of non-linear effects and autocatalysis in asymmetric organic synthesis**". It is related with chirality which sounds like an abstract science but it is all around us, even on our bodies. Some molecules, such as amino acids, exist as two mirror images of each other, often called enantiomers. It is somewhat similar to like our hands. However, living organisms contain only one of these mirror images. This chemical asymmetry was long a mystery to chemists. It was solved by these two chemists who found a solution to this puzzle. Henri Kagan and Kenso Soai (Photo1) have provided a solution to a century old chemical mystery: how homochirality can emerge spontaneously. Here *homochiral* is a Greek word, meaning "same hand". Henri B. Kagan was born in1930 in Boulogne-Billancourt, France. He earned his PhD in 1960 from Collège de France, France. Presently he is Professor Emeritus at the then Université Paris-Sud, France Kenso Soai was born in 1950 in Hiroshima, Japan and obtained his PhD in 1979 from University of Tokyo, Japan. At present he is Professor Emeritus at Tokyo University of Science, Japan.



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If we hold our hands palms up, these form mirror images of one another. However, we can never put our right hand exactly on the top of left palm facing the same way. In a normal chemical reaction, two mirrored image molecules are always formed in equal proportion. However, chemists strived to produce only one of these mirror images, because in the development of molecules that will interact with living beings – such as in pharmaceuticals – only one mirror image will have the desired effect. In 1986, Henri Kagan discovered a new way of manipulating chemical reactions which allowed him to create a greater excess of one of the mirror images than had previously been thought possible. In 1995, Kenso Soai took the next step when he designed the first ever chemical reaction that had the potential to produce a single product called homochiral or one form ("R" or "S") only. In 2003, he finally succeeded to produce a reaction in which only one of the two mirror images was formed – a feat no one had previously achieved earlier.

In the human body, cell receptors and enzymes are built from single handed proteins. A pharmaceutical molecule enters the body like a key looking for its lock. If a drug is a mixture of mirrored image molecules then only one of it will fit the receptor perfectly whereas the other twin not and that may trigger unintended side effects or may fit as a key into a different enzyme disrupting body's function. A good example of this are Thalidomide (called "S" form) and Ibuprofen (called "R" form) shown below in Image 1. Former one eases from pain and swelling but the latter is inactive.

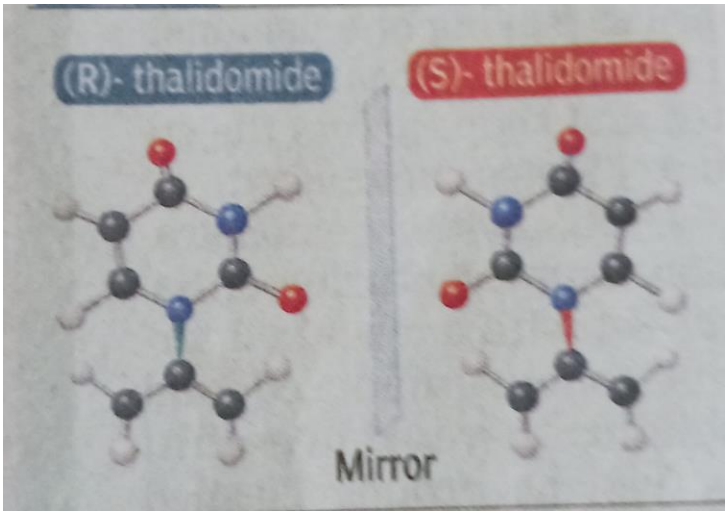


Image 1: Thalidomide (called S form) and Ibuprofen (called R form)

Our body corrects the mixture so that a pill containing both forms is commonly used. A question arises as to why not to have more of the former ("S" form) only in a dose. Kagan solved this problem by using a catalyst that produces a single product in purer form. Later Sorai found a way to make a single product in pure form. Their work showed how an asymmetry between two chiral forms can grow into a decisive preference. Now chemists are building up new materials, not just medicines.

Readers may find it useful to see following Links for illustrative reactions of the two Laureyes;

Illustration of Kagan's discovery:
https://www.nobelprize.org/uploads/2026/10/fig4_ke_en_26_copy-srgb.jpg

Illustration of Sorai's reaction: https://www.nobelprize.org/images/195541-large-2x.jpg.