

## Expected application to temperature-responsive smart windows

There are known compounds that exhibit phase separation when solutes dissolved in solvents exceed a certain temperature (LCST). Poly (N-isopropylacrylamide) (PNIPAm) has been studied as a representative of these compounds, and applications to temperature-responsive smart windows have been reported. However, since the LCST of PNIPAm is constant at 31° C, a compound that can flexibly respond to the LCST depending on ambient temperature has been desired in industry.

The inventors succeeded in synthesizing a new compound. This compound is characterized by the ability to control the LCST within the range of about 25–55° C by modifying a part of its structure. When applying to smart windows, most of them require a power supply because they switch between transmission and non-transmission by turning the voltage on and off. On the other hand, smart windows using this compound can be used in places without a power supply because they switch between transmission and non-transmission spontaneously according to changes in the outside temperature. Furthermore, by controlling the heat according to the degree of light transmission, it is expected to be effective against heat.

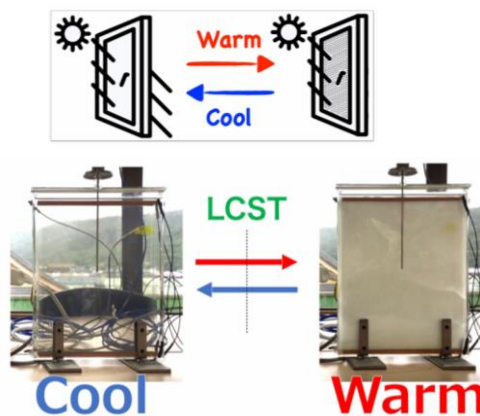
## Product Application

- ❑ Temperature responsive smart window
- ❑ Temperature responsive film
- ❑ Material to visualize temperature changes
- ❑ Surfactant

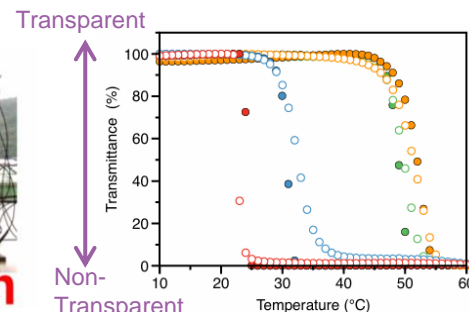
## IP Data

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Admin No. : MU24-002

## Features · Outstandings



It becomes transparent at lower temperature than LCST and becomes turbid at higher temperature.



LCST changes by structural modification  
→ Compounds with optimal LCST can be selected.

## Related Works

[1] JST New Technology Briefing Announced on October 1, 2024 "Aqueous solution that uniformly dissolves when cooled and separates and becomes turbid when warmed, and its application"

[https://shingj.ist.go.jp/list/list\\_2024/2024\\_hokkaido.html#20240709X-003](https://shingj.ist.go.jp/list/list_2024/2024_hokkaido.html#20240709X-003)

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